American Machinist

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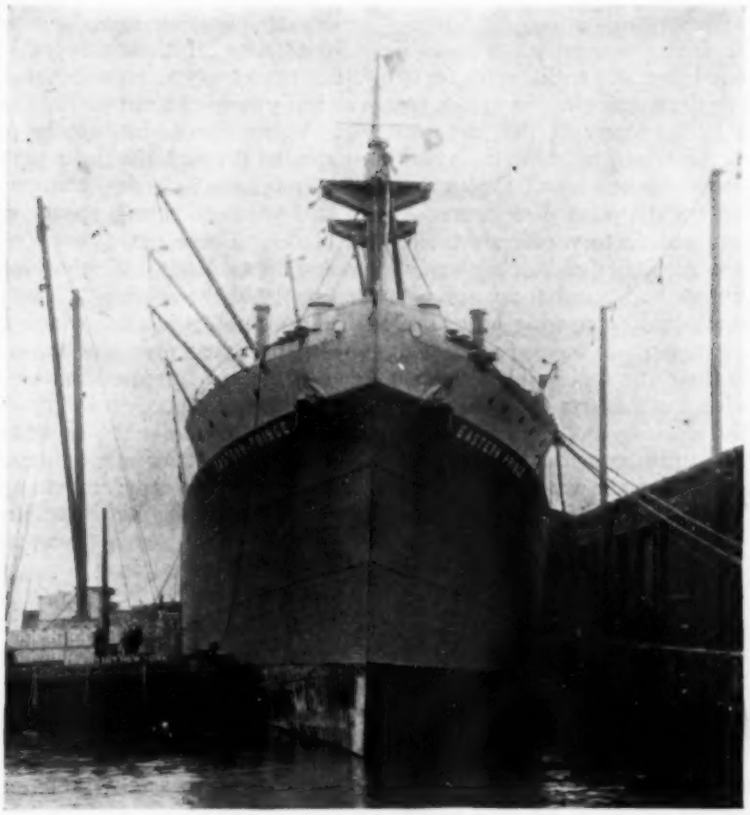
# SALES ACROSS THE SEAS



**Ten machine tool builders add their experiences and opinions to those of Messrs. Rastall, Wood and Williams published in the *American Machinist*, pages 169, 283, and 321, of Volume 72.**

"TO BEGIN with, your company must be known abroad as a substantial business concern in which the foreign machine tool buyer can have confidence," writes one of ten machine tool builders who have contributed their experiences and opinions to this article on what to do and what to avoid in handling export business. "This confidence must be one hundred per cent on the part of the dealer as well as of the prospective customer. It is necessary to be absolutely fair and above board at all times in relations with dealers, and there must be a sympathetic attitude toward local problems of distribution. Promises must be rigorously kept. There is always a tendency for a foreign buyer thousands of miles away to feel that a domestic customer is getting preference at his expense. The foreign buyer, if he wants to buy American tools at all, wants to buy what he considers the best; nothing but the best will satisfy him."

The advantages of American machine tools were possibly first generally recognized by foreigners at the Chicago World's Fair in 1893. After careful inspection of an American plant, a woodworking machinery manufacturer from Leipsic, Germany, placed an order for four turret lathes. These machines, when completed, were carefully boxed for export and arrived safely at their destination. They were successfully demonstrated in the customer's works in Germany by a man who later became the president of his company. This was the start of export business in machine tools and also the beginning of sales engineering

service in foreign fields. Since then the American machine tool manufacturer has always occupied a prominent place in the export markets of the world, largely because of the quality, accuracy, and production of his tools.

Soon after the installation of the first American machines abroad, the company which sold them placed an agency in Germany and other agencies subsequently in England, France, and other countries. The success that came from having trained, practical men in the foreign countries grew to such an extent from year to year that before 1914 several American machine tool manufacturers were disposing of 30 to 50 per cent of their output in export. Several of these successful exporters had two to five thoroughly trained men abroad all the time. During the world conflict of 1914-1919, much of the prestige of American machine tools was lost, except with our allies, through lack of contact on our part and a desire of Europeans to buy at home. The native salesmen in the foreign countries who had received much of their knowledge and enthusiasm for American machinery from American sales engineers, were practically non-existent in 1920. Many of the factory men in whom the desire for American machine tools had been created through the native salesmen and through practical mechanics from this country also disappeared. New and younger salesmen and factory officials took their places. These new men were not familiar with the latest American machines and methods, and the result was that in 1920 the work which had been done before 1914 had to be started all over again. It seemed more than ever before that American machine tool builders were obliged to look to foreign fields for markets for their highly specialized machinery. The machine tool capacity of this country was extensively built up in consideration of our exports, and of course, because of the war. It is safe to say that few, if any, American manufacturers are exporting as extensively or in the same proportion as they did before the war.

What are the requirements for exporting American machinery successfully? A product designed with all the latest features, incorporating good looks and rigidity, well manufactured and neatly finished, splendidly boxed for export, and sold through agents assisted by sales engineers who are diplomatically aggressive and who know their products thoroughly.

The last of these seems to be the factor most difficult to solve. Years ago men were anxious to go abroad and make a job of it, whereas today it is almost impossible to get younger men interested in foreign field work. On the other hand, men who are successful in this country are often unsuccessful in foreign fields. It takes men of rare makeup, cosmopolitan in their ideas, with a desire to learn and speak foreign languages. Hundreds of men who are possibly the very best at home go out with enthusiasm and come back complete failures.

IT would seem that this problem might ultimately be overcome by a national movement through schools and universities rather than by leaving to the individual industries the encouragement and development of their own men. England and Germany, who are strongly dependent upon exports, are continually encouraging and developing men for foreign fields. Compared with the traders of these two countries, we seem like grade school scholars in the export business. The successful American abroad seems to be the one who can best suit himself to foreign conditions and who can refrain from criticizing methods and modes of living on which millions of natives are thriving.

We have many lessons to learn regarding credit, trade acceptances, foreign exchange, and the like, for it is doubtful that we can always insist upon dollars New York and have our export business grow as our industrial progress indicates will be necessary. If the natural expansion in industrial machinery is to be absorbed, the exports of our country must be developed. In too many cases our exports consist of products that are being "bought" and not "sold." Many manufacturers still have the feeling that any article is "good enough" for export trade.

The companies most successful in exporting are those which give export orders equal consideration with domestic in such matters as quality, and regular sequence in the delivery schedule. A delivery promise must be kept. In fact, everything must be done to command respect and confidence which, when once established, is as valuable and satisfactory as in trade at home. It would seem that our necessity for exports is great, but our desire to learn and to comply with conditions attending them is small.

SO many machine tool builders make the mistake of essaying the export market when business at home has become dull. They find, to their sorrow, that export business is not done that way. Only by consistent, year in, year out salesmenship and good-will building can the American manufacturer hope to develop a steady, profitable export business. Except for minor differences, selling machinery in Germany, Australia, or Japan, is the same as selling machinery in Detroit.

A preliminary survey of industrial conditions in foreign countries and an investigation of the dealer organizations which operate in these countries are both highly advisable before any sales effort is contemplated. The Department of Commerce will readily furnish statistics and other data which, if wisely used, should prove valuable. Having determined which countries are likely to provide the most profitable market for a particular type of machine, (and specialization is just as important in foreign markets as in domestic), contracts may be made with machine tool importing houses in the countries selected. A number of these importing houses have been in existence for many years. They are constantly in touch with the trade and operate much the same as machine tool dealers in this country. Some manufacturers prefer the smaller, more specialized houses to the larger.

Personal contact is as important in export selling as in domestic. The most successful exporters maintain factory representatives on the ground to work with the

dealers. These representatives should be factory-trained men, and if possible, should be combinations of salesman, engineer, demonstrator, and trouble man. Preferably they should be able to speak one, if not two, foreign languages. In some instances, where the volume of business is large, the builder may well maintain staffs of engineers, salesmen, and trouble men, each allotted to a definite territory. The next best arrangement is to have the representatives of the foreign dealers visit their American suppliers and spend enough time at their factories to become thoroughly posted on the products. These representatives should not only study the design and construction of machines, but should also spend time in the estimating department making time studies of customers' work. In many cases also they could be taught to operate the machines in the shop. These visits are particularly valuable for the smaller machine tool manufacturer who does not feel that he can afford a direct representative.

A manufacturer's relations with his foreign dealer must be very definite and must not deviate from established practice. A wavering policy will shake the confidence of both. Strong and friendly personal relationships must exist between principals and dealers. The builder must know what are the requirements of the markets in the various countries, and his effort must be concentrated on the types and sizes of machines which he can most easily sell.

Advertisements and sales literature will be of very little value unless printed in the language of the country where they are circulated. In some cases, the same advertisements used in America will serve well enough if translated, but particular attention must be given to the avoidance of overstatements or extravagant claims, or anything, in short too "American." The average over-seas buyer is inclined to be critical of any signs of overstatement. He is influenced by the press of his country which is sometimes anti-American in its sentiment toward American trade and all too ready to pick flaws. A conservative tone in sales literature is therefore desirable. Price lists for the use of foreign dealers should be clearly arranged and detailed. Many builders have the same prices for their agents abroad as for their dealers at home, and all receive exactly the same discount. They insist that the agents use this price list as the basis for the price to their customers, adding only insurance, tariff duties, and transportation costs.

In order to handle over-seas inquiries to the best advantage, it is advisable to have a trained correspondent in the sales department of the home office. If the volume of business warrants it, a special export sales division would be a further advantage. The location of a trained export man at New York for contacting with the forwarders in that city is also a great help in conducting export business and handling export problems. Exporting is not so different from the conduct of domestic business, but there is real value in concentrating your sales effort. In machine tool selling, men who handle the correspondence from specific territories gradually build up acquaintances and connections that are very helpful in getting the most out of the market. If letters are received in foreign languages, the translation service should be prompt and adequate. The translation of technical letters is not an easy thing to get done accurately, and so much may depend upon the exact meaning of a word.

PARTICULAR care should be used in estimating what a machine may be expected to produce. The experience of a native representative may prove valuable in this connection. One builder reports that in attempting to sell the economy advantages of his tools over older and other methods he ran into a difference in manufacturing conditions, under which the tools were to be used, that quite changed the angle of approach. For instance, the rates of labor, the proportions of overhead, and the attitude of both labor and management toward production equipment were such that, in order to justify an investment in the higher priced American machinery, it was necessary to emphasize the mechanical efficiency, the quality, accuracy, and method involved, rather than economy. The attitude of both labor and management toward these methods was very often such that if they obtained a good proportion of the possible gain, they were satisfied. In cases where, under American conditions, three or four units would be installed for a given production, foreign conditions made it necessary to install five or six for the same physical volume. Where the American shop management objects violently to the loss of a few seconds per piece in production time, the European is resigned, and feels that if a few more minutes are necessary for the production of the work, it is not too serious a matter.

But, despite experiences of this sort, which as often as not operate in favor of the American machine tool builder, there is little difference between selling abroad and at home. It may go without saying that the product should be of the best, that no straightforward, honest sales opportunity should be missed, that adequate and prompt service should be provided for, and that all these should be maintained day in and day out from one year to the next increasingly. Under these conditions, every installation over there ought to advertise the product the same as it is supposed to here, and the more machines, therefore, that are sold, the more the demand should increase for the product. Thus, sales across the seas should gradually grow and develop until they become not merely "stop gaps" but regular "bread and butter" items on the ledger.

**Information for this article has been contributed by**

**J. E. Andress**
*President*
*Barnes Drill Co.*

**Henry S. Beal**
*Assistant Manager*
*Jones & Lamson Machine Co.*

**E. P. Blanchard**
*Assistant Sales Manager*
*The Bullard Machine Tool Co.*

**A. C. Cook**
*Vice-president*
*The Warner & Swasey Company*

**G. L. Erwin, Jr.**
*Sales Manager*
*Kearney & Trecker*

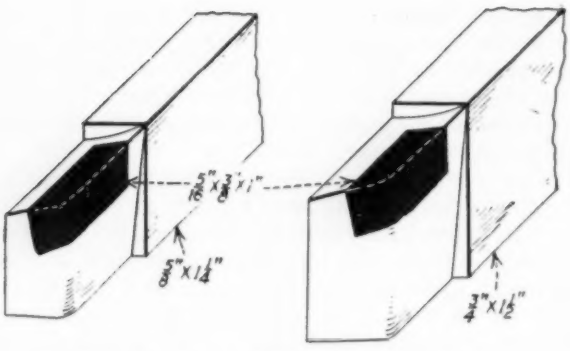
**James E. Gleason**
*President*
*Gleason Works*

**C. H. Johnson**
*President*
*Gisholt Machine Company*

**Wallace T. Montague**
*Assistant General Sales Manager*
*Norton Company*

**W. F. Slomer**
*General Sales & Service Manager*
*The Fellows Gear Shaper Company*

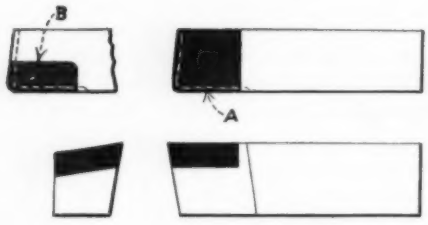
**W. W. Tangeman**
*Vice-president*
*The Cincinnati Milling Machine Company*



Increased tool size does not necessarily add to the cost; the two tools illustrated use the same size tungsten-carbide tip

# MORE CHIPS FROM TUNGSTEN-CARBIDE TOOLS

By FRANK W. CURTIS



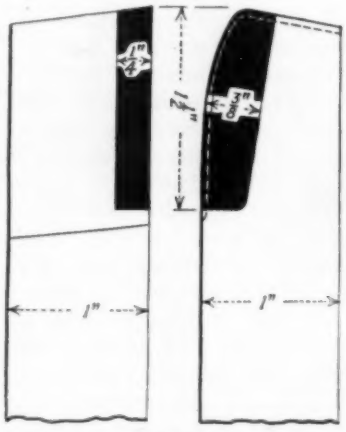

Tips entirely across the face are to be avoided. Provide a recessed shank whenever possible

CEMENTED tungsten carbide has been used commercially for more than a year with remarkable success. As in the introduction of any new product, there have been failures and disappointing results, due largely to misapplication. In most cases of failure, there is a remedy, sometimes involving only a minor correction, and sometimes necessitating a major change in set-up.

The ideal application for a tungsten-carbide tool is one in which the tool is ground as often as the steel tool previously used. To effect this condition, it is necessary to increase the feed and speed, so that the gain will be reflected in increased production. The measure of performance is, of course, the rate of removing metal. For example, let us assume an operation is being performed at 60 ft. a minute, $\frac{1}{4}$ in. depth of cut, and $\frac{3}{32}$ in. feed, necessitating the grinding of a tool every three hours. The correct tungsten-carbide application then is to increase the speed (and the feed if necessary) so that this tool will also have to be ground every three hours. If, without grinding the tool more frequently, the speed may be increased to 240 ft. per minute, keeping the feed constant, the amount of metal removed per minute will be 400 per cent greater.

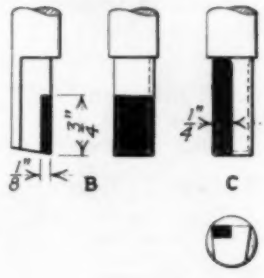
The only hindrance in applying tools this way is due to the limitations of the machine equipment now available, which, relatively speaking, is inadequate to withstand the high rate of metal removal made possible by tungsten carbide. For this reason, it is often necessary to sacrifice the maximum increase in speed and feed to suit machine tool conditions resulting in a longer life between grinds in addition to a production increase. Many machine tool manufacturers are developing equipment to suit the possibilities of cemented tungsten carbide, and in the near future, it will be possible to take full advantage of this new cutting metal.

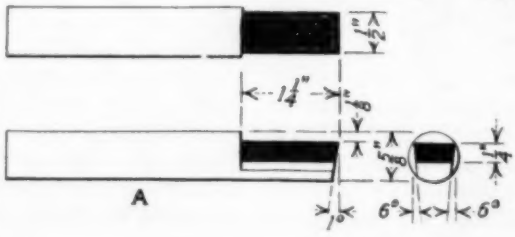
Perhaps most of the failures of cemented tungsten-carbide tools are the result of attempting to duplicate conditions that already exist for other metal-cutting tools. For this reason, it should be borne in mind that there is a distinct difference in the application of tungsten carbide and other cutting materials. Therefore, it is necessary to analyze each application instead of attempting to follow former practice. Incidentally, the technique required in applying tungsten-carbide tools is no more difficult than that required for any other type; it is merely different.

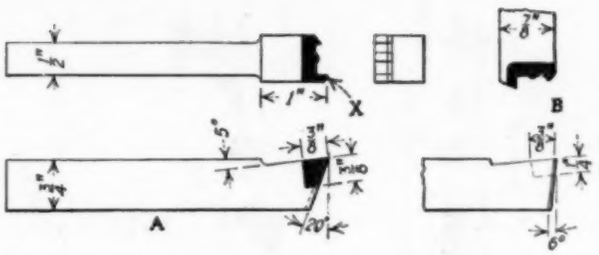



Long tips are also troublesome. For the tool shown 2 in. of tungsten carbide would be better

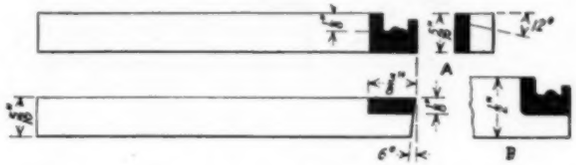
The tip shown at A is too thick as well as too long. It should be made thinner and shorter B, or recessed as at C



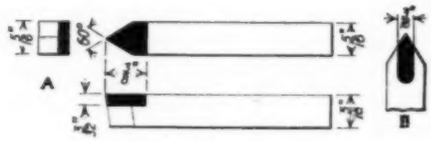






**In feeding-in the tool shown, point X strikes the work first. The design shown at B gives desirable additional support by use of a recess and a smaller clearance angle**




**Form tools should be recessed to provide backing against the cutting pressure**




**The threading tool shown at B provides economy of material and will give better service**

There is a direct relation between the horsepower required to remove a given amount of metal and the speed used. Likewise, greater rigidity is required when an additional amount of metal is to be removed necessitating the use of larger tools. Too often is this point overlooked, with the result that the tool fails. Every means must be taken to avoid vibration, the cause of failure in many metal cutting operations.

ASSUMING that a high-speed steel or stellite tool $\frac{5}{8}$x1$\frac{1}{4}$ in. in size is cutting a cast-iron roll, it will be safe to assume that a $\frac{3}{4}$x1$\frac{1}{2}$-in. tool, or one even larger, would be required for cemented tungsten-carbide practice. The increase in size will add rigidity to the operation and permit a satisfactory increase in speed and life between grinds.

Incidentally, the cost of a large tool is not necessarily greater than one of smaller design, inasmuch as the same sized tip can be applied on two shanks. The only additional cost would be for the extra weight of the shank plus a very slight manufacturing charge.

In designing any tungsten-carbide tool, there should be a direct relation between the thickness of the insert and the depth of the shank to which it is attached. A good ratio is 4 to 1, that is, four times as much shank thickness under the tip as the thickness of the tip itself. The shank is always weakened when recessed for a tip, a factor that should be taken into consideration and one that favors a heavier tool. Sometimes these proportions cannot be carried out, and under favorable conditions, a ratio of 3 to 1—the shank three times the thickness of the tip—may suffice. With any lower ratio, trouble is probable, inasmuch as the repeated strains set up during cutting will cause the shank to spring more readily and may cause the tip to become fractured or even to break out. Such repeated strains also affect the braze, and it is not uncommon to have the entire tip come off after the tool has been in use a short length of time.

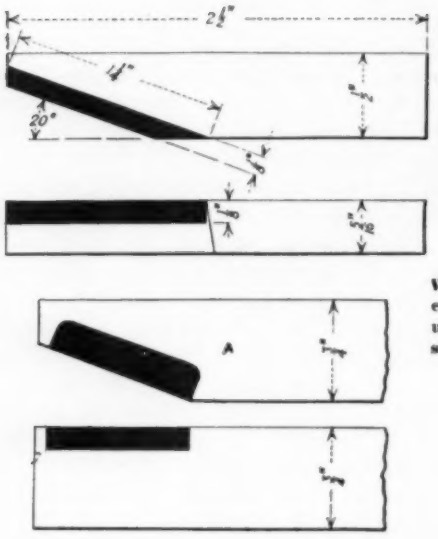
Perhaps one of the worst practices, in the use of tungsten carbide, is an application having a tip across the entire face of the shank of a tool to be used for heavy cuts. The tip is provided with no backing to resist the cutting pressure, making it likely that the insert will either break or come off entirely. For this reason, a recessed form of tip is preferred and should be used whenever possible. Sometimes it is necessary to have the tip placed across the shank, as for round nose tools that are called upon to feed directly into work to a predetermined depth before starting a power cut. If the tool is not called upon to remove an excessive amount of metal, there may be no difficulty, but usually the application can be modified, so that the proper design of tool can be used. Of course, there is a class of tools, piston grooving tools for example, that must have the tip placed directly across the face but in work of this type the side pressures are equalized, and there is no appreciable strain set up in the tool or the tip.

THE length of the tip in relation to the shank is important. Sometimes, due to the cost of cemented tungsten carbide, there is a tendency to feel that a tool having a long tip will be more economical. This thought is ill considered, because it is very much better to have two tools with an equivalent amount of cemented tungsten carbide than one poorly proportioned. Take for example a 1-in.x1-in. tool with a tip $\frac{1}{4}$-in.x$\frac{3}{8}$-in.x1$\frac{1}{2}$-in. When this tool is put to use under heavy service, there will be strains set up in the cutting tip, and there is a strong possibility that the front section of the tip will eventually come off. If this tool were made with a cutting tip $\frac{3}{4}$ in. in length, the design would be more appropriate. Where tools such as this one have been put to use, and the front end of the tip has cracked or broken off, it has been found that upon regrinding for additional service, the tool has performed remarkably well without any further difficulty. To sum up this condition, tips too long are not economical, due to their possible failure, and it is very much better to analyze this point thoroughly before designing such a tool.

Tip thickness as well as length should be kept within definite proportions. When both these dimensions are excessive, the shrinking of the shank after brazing will set up enormous strains in the tungsten carbide. This may result in the tip's cracking during grinding, or if it is finished successfully, breakage may occur when the tool is first put into service.

Regardless of the type of tool to be used and the nature of the metal-cutting operation, it is necessary to provide sufficient support directly under the cutting end. Many tool failures are directly traceable to inadequate provision in this direction which has sometimes led to the erroneous assumption that the cutting insert was inferior. As a rule, the underneath portion of the shank will show how the tool was supported, and very often the overhang will be found to be from one to three inches.

When a cemented tungsten-carbide tool is permitted to overhang without support, the repeated strains and




When broad cutting edges are essential use a recessed design and a heavy shank

stresses set up during cutting have a tendency to weaken the cutting tip, due to slight bending forces. After a certain amount of use, the tip is quite likely to crack in two, and sometimes a large section will break out entirely. In cases of this kind, there can be a direct loss charged to lack of rigidity, the result of faulty design.

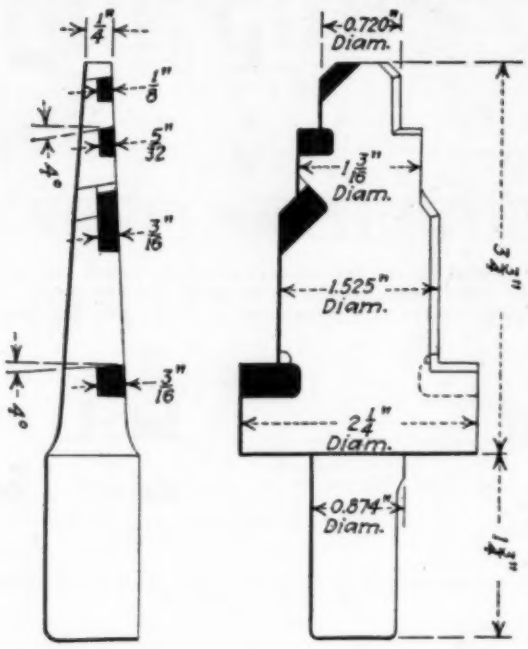
Such conditions are particularly noticeable for forming tools which are fed directly into the work. Any narrow projection is subjected to a sudden strain as it strikes the work and has a tendency to break off. Wherever possible, such tool elements should be designed to receive the maximum support and the shank size increased to add rigidity. Since forming tools are comparatively expensive to make it is good economy to take extra precautions in backing the tungsten-carbide tip.

A SIDE forming tool should not be made with a tip clear across the shank, as trouble will usually result after use. Most tools of this kind can be designed to include a recessed construction by widening the shank. When this is done the result will be a gratifying increase in the life of the tool.

High speed steel tipped threading tools are commonly made with tips across the entire face, a design which does not lend itself to tungsten carbide. Only the extreme points of this class of tools are used for cutting, making it possible to provide a recess supporting the tip on both sides. The additional support will not only secure increased production, but materially reduce the amount of tungsten carbide required, decreasing the cost materially.

There is often necessity for a tool having an angular cutting face along one side, and the general tendency is to place the tip along the entire face. Tools made this way have failed in service, and such failures, although directly related to poor design, seem to hinder the progress of cemented tungsten carbide, and are naturally a waste of money to the user. The difficulty with a tool of this kind is that the tip is too long for its cross-section, and there is a great possibility that cracks will develop after the tool is put in use. In fact, this type of tool causes difficulty in manufacture, because certain strains are set up during brazing which seem to relieve themselves when the tip is being ground, the result being that the cemented tungsten-carbide tip cracks before the tool is even completed. If it is necessary to have a broad cutting face, the tool should be made with the

**A large number of cemented inserts is undesirable. Substitute an adjustable boring bar when possible**



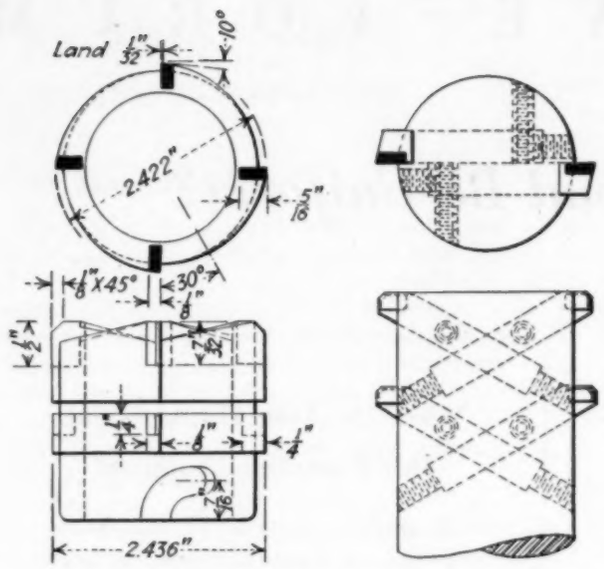

tip inserted in a recess and with a shank of heavy proportions. Upon rigidity depends the success of any metal cutting operation, and it is always better to apply a tool much heavier than required, rather than one with a questionable weakness.

Tools having a large number of inserts are not always practical, and if possible some provision should be made to make each insert a separate replaceable unit. With a solid cemented construction, if any one of the inserts should fail or become damaged, the tool will be practically useless.

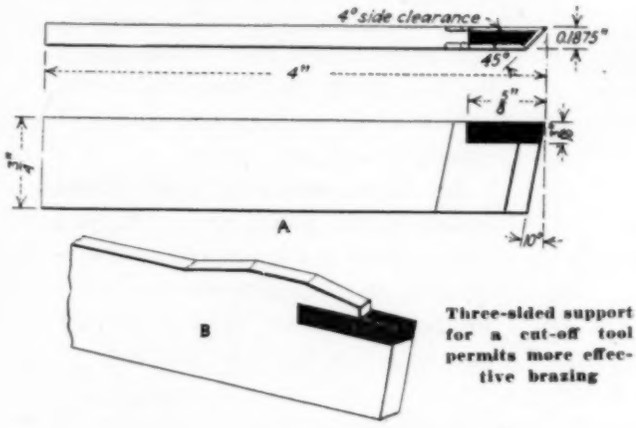
To analyze this design let us assume that one of the inserts becomes cracked or chipped; the first thought would be to insert a new tip. This involves great difficulty, since it is necessary to reheat the entire tool to brazing heat, approximately 2,000 deg. F., with a result that the tip is likely to warp out of shape. Then again, the tips that were satisfactory, are quite likely to shift one way or another, and certainly if the size should become smaller, the tool would be useless. The only practical way to replace a tip is to remove all the tips regardless of their condition and insert new ones.

TO PUT it plainly, the high cost which a tool of this kind involves must be charged to loss due to failure, and the failure is due to lack of analysis. Then again, due to the accuracy required of this type of cutter, it will give very little service, because the various diameters will be undersized after the first grind. When a tool of this kind must be used, there is a fine opportunity to employ an adjustable type of boring bar to accommodate small blades that can be used for their entire life.

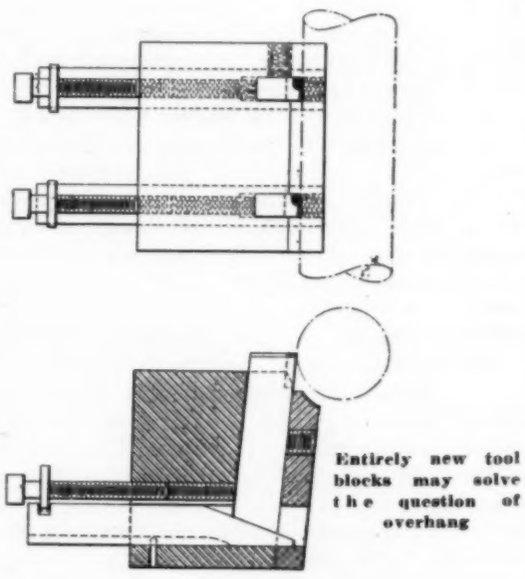
Cut-off tools should also be modified when used with tungsten carbide. As previously explained, a tool of this kind must have the tip placed across the entire face, but due to the equalized cutting action on each side of the tool, there is no direct strain on the tip, except in a backward direction, which receives support from the shank. However, tools of this kind should be strengthened by the inclusion of an overhead bridge so that




**An adjustable boring bar will permit repeated grindings of the tungsten-carbide inserts and is usually superior to a cemented construction**




**Three-sided support for a cut-off tool permits more effective brazing**



**Entirely new tool blocks may solve the question of overhang**

a brazing surface is attained on three sides of the tip.

The conventional type of toolblock, which holds tools in a horizontal position, has certain objectionable features when used with cemented tungsten-carbide tools, especially when heavy cuts are to be taken. A horizontal design is satisfactory at times, but in spite of warnings and rigid instructions, there is always a likelihood that the operator will deviate from recommended practice resulting in excessive overhang and loss of rigidity. To overcome such a condition, a foolproof toolblock should be used, and judging from recent experiments a block that holds the tool vertically is to be preferred.

A vertical toolblock may be designed with features that can be applied to a variety of operations, using either a single tool or multiple tools. The outstanding qualification is that the pressure of the cut is carried by the entire length of the tool. Such an application permits ample rigidity, and will add life to the tool.

When the cutting edge of the tool becomes dull, it is necessary to grind only the top face, since the tool is mounted with the proper side and front clearance angles. Vertical adjustment may be obtained by means of a wedge operated by a collar screw. The block itself can be made to suit the carriage of the machine, and applied so that the cutting pressure will be transferred directly to the ways, an added insurance of rigidity.

Machinery will soon be developed to suit the efficiency of cemented tungsten carbide, but there is much existing equipment which will be equipped with tungsten-carbide tools. All the points outlined above should be carefully analyzed before a tool is applied: calculate the size of the tip required; increase the size of the shanks in practically all applications; strengthen the toolblocks and add additional support under the cutting end of the tool; be sure that the tool receives the proper amount of rigidity. Sometimes an attempt is made to get by with the present equipment without making any changes, but remember that success depends upon rigidity and rigidity is only made possible by adequate strength.

## Using Blind Ads—*Discussion*

By P. H. Pearson,
*Foreman, B. F. Sturtevant Company*

USING blind ads in advertising for executives was criticized by Mr. Kruger on page 862, Vol. 71, of *American Machinist*. There may be many reasons for using them. When a man applies for a responsible position, he is rarely engaged on the strength of his letter, whether he is writing in answer to an ad or not. An interview almost invariably follows, so that both parties have an opportunity of "sizing each other up."

If an open ad is used, applicants who consider themselves capable of filling the position, whether they actually are or are not, will seize the opportunity to gain an interview, in the hope that they may be able to "put one over." Blind ads eliminate much of this trouble. The advertiser has an opportunity to judge the caliber of the applicant by his letter of application. Then again, the company may be reluctant to let anyone know they are seeking a man for some certain position. There may be someone who is to be replaced and who might leave before his successor has been found.

One phase of the blind ad system is deserving of criticism, the request that all particulars and wages desired be stated in the first letter. It is only natural that the applicant should be as cautious as the advertiser. Why should the applicant give intimate details when he doesn't know to whom he is writing? It is time enough to give these particulars at an interview.

# EXECUTIVE · FORUM

## *Should Overhead Be Uniform?*

MAY 22, said the calendar on Kenneth Norton's desk. "May 22," repeated Kenneth Norton mechanically, and then he suddenly remembered that, just two years before, he had taken up his duties as comptroller of the Mid-City Machine Works. When he had started there, an atmosphere of hidebound tradition had pervaded the plant. Methods of keeping records were antiquated; the cost system had been a relic of the last century. Only within the past few months had he felt that the last cobwebs had been effectually banished.

Norton's reminiscent train of thought was interrupted by the entrance of Walter Howe, Mid-City's sales manager. "I'm after your scalp this morning," Howe greeted, his cheery grin belying his threat.

"A few more years of a comptroller's life, and my scalp won't be worth taking," came back Norton, catching his associate's contagious good humor. "But what's the trouble now?"

"Yesterday, I had a talk with Stacy, purchasing agent for the Dobbs Pump Company. He claims that the quotation we made him last week is too high. Three years ago we took a similar job from them, and Stacy says our price then was just a little over half that we are now quoting. He says the two quotations don't look right when compared."

"I know," assented Norton, "but the work we did for Dobbs Pump three years ago cost us real money. That quotation was not figured right."

"How could that be?" asked Howe. "It was all straight machining and should have been easy to estimate. I don't remember any talk of an overrun at the time; I had it in the back of my head that we made something on the job."

"The estimate was very close," Norton advised. "There was a general impression that the job was profitable; even our books showed a balance on the right side. The trouble lay in the method of figuring overhead then in use. It was taken as a flat percentage of the direct labor."

"Isn't that common practice?" inquired Howe.

"All too common," agreed Norton. "The planers used in the Dobbs Pump job are some of our largest pieces of equipment. They represent a big investment and occupy a lot of floor space. They take more than their share of supervision, crane service, lubrication, and repairs. Our present costs take these facts into consideration."

"But according to that we should be getting more money for all our large sizes of standard product. Our prices haven't doubled on them," Howe pointed out.

"On our regular production, we make the entire machine," Norton reminded. "The extra cost of machining the large castings is somewhat balanced by the reduced overhead carried by the smaller parts. The Dobbs Company wants us to take only the big work, which they can't handle themselves. No one who knows how to keep accurate costs will beat our quotation very much."

"Not being a cost man myself, it all sounds pretty complicated—having so many overheads in one shop," said Howe. "It is sort of tough on the poor salesman when he runs against competitors who use less science and get more business."

**What Do You Think About This Executive Problem?**

**A uniform method of cost keeping has not yet universally been adopted. This is exemplified by the variations in methods of handling overhead charges. Some concerns make overhead a percentage of the labor cost, others use a flat hourly burden rate; while still others have adopted the so-called machine centered system.**

**All cannot be correct, yet all are widely used. What method do you use? What are its merits and disadvantages? American Machinist invites discussion on this subject, and will pay for contributions.**

# DISCUSSION

## OF PREVIOUS PROBLEMS

### *Sales or Sincerity?*

The sales department should not have arbitrarily pared the estimated delivery time but should have tried to arrange with the production department to reschedule their work to accommodate a five-week promise, without disrupting their regular program. Promises to consumers, once made, should be rigidly adhered to, and none should be made which cannot reasonably be expected to be kept. The consumer's program may be badly discommoded otherwise.

Nothing is more aggravating or less productive of maximum results than an inflexible schedule. While the shop efficiency may be slightly impaired by changes, the efficiency of the business as a whole may be improved. Rearrangement of shop schedules, however, should only be called for in cases of genuine need, not merely to accommodate an over-ambitious sales department.

—DOUGLAS L. PARKHURST,
*U. S. Coast and Geodetic Survey.*

### *Who Should Do the Estimating?*

To employ an estimator to whom the whole job of preparing an estimate is allotted is fallacious. It is impossible for him to keep up to date with production methods in the shop, as he is in no way connected with shop conditions; and they cannot be fully appreciated unless a daily contact is maintained.

The most satisfactory method is for the chief ratefixer to be in charge of the estimating. When a job comes through, it is handed to each of the ratefixers who work out the time required for the job in the department coming under their jurisdiction. These times are all added on one sheet which, when complete, is handed to the chief who consults each foreman into whose department the job will go if the order is obtained.

The apparent reason for the success of this scheme is that the ratefixer is brought into very close contact with actual shop conditions, even more so than the foreman himself, and all points likely to cause difficulty are raised.

—RONALD L. TANDY,
*Newark-on-Trent, England.*

### *What Price Titles?*

No doubt most of the readers of *American Machinist* are aware of the high sounding titles the Germans hand down to their various officials, such as Herr Gemeindersrath, (Mayor of a small hamlet). Let our Herr so-and-so go to the corner delicatessen store, order a pound of his favorite franks and sauerkraut, and after these have been wrapped up, say to the dispenser of modern American suppers, "I am Herr so-and-so." Well, that might mean something, but unless some coin of the realm is produced, our friend will depart without his viands. Such is the case of titles.

Rather a number on the pay envelope and know that the pay inside it has been earned by honest toil, whether it be by brain or brawn, than an empty title. For, in the end, titles will not butter the bread, but the long (rather short now) green will. So let's forget titles, and get down to work and earnest co-operation.

—FRED KLINGENSTEIN.

### *To Whom Should the Chief Inspector Report?*

Each organization has its individual problems to work out, and whether the chief inspector should report to the chief engineer or the general manager, depends largely upon the general lineup of the organization. If the chief engineer is in charge of designing, I think he is qualified to be in charge of inspection, but where the general manager is active in both engineering and production and works closely with the engineering department, I think he is in a better position to know where to draw the line.

Unless a lot of common sense is exercised the inspector will perhaps, go to the extreme, and it is very important that he is in charge of a practical man.

—A. F. ERICKSON, *Vice-president, All-Steel Equipment Company.*

### *Equipment Replacement in Slack Periods*

The wide-awake, up-to-date management always prepares for the prosperity that follows a time of depression. The cream of the business is gathered by the firm which is ready and waiting for it. A sound program of equipment replacement should always be going on as the equipment becomes worn out or obsolete. But a time of temporary business depression is the proper place to launch major operations along this line in any well-managed plant. It is true, that such large expenditures in a dull period, will not show a large profit, or maybe show none, but the benefits will be reaped in the long run.

Prices are always lower and delivery times shorter in periods of slow business. Besides this, rates for borrowed money are often easier and should be taken advantage of. As a rule, the supply of labor is larger at this time, and plenty of help can be obtained to get the work done quickly. Of course, enthusiasm must be curbed somewhat, and the plan put into effect, not to expand the plant unduly, but to modernize it. At the same time, means can easily be provided for expansion, when this is justified by the sales.

While production is cut down by the

depression in business, it will not suffer serious interruptions while the changes are being made. Since the pressure of productive demands are not as great in this kind of period, more time can be given to working out the plan of the plant, so that every operation can be done properly and economically. The best methods of routing, handling, and storage can be worked out and installed. As the new projects are placed in operation to meet the rising demand for production, the fruits of a far-sighted policy will be reaped in increased profits.

—L. O. BROWN, *Toolroom Foreman, Holcomb and Hoke Manufacturing Company.*

### *Should Estimates Be Given Operatives?*

The question of letting operators know cost estimates depends quite a bit on the ability of the estimator, and on whether or not the work is such that it lends itself to accurate cost analysis. If accurate, detail, operation costs can be arrived at, they should by all means be given to the operator, along with instructions for his operation. If, however, the estimates are not very accurate, it is far better to let them get no further than the superintendent.

If the estimated time is too liberal, the tendency of the operator is to feel that if he meets the time allowed he has done his "bit," even though he might have finished it much sooner. If, on the other hand, the estimate is so low that the operator cannot possibly meet it, he has nothing to try for, and usually sinks the job in order to get a more liberal allowance next time. However, if the estimates are accurate, the operator has something to shoot at, and production is usually increased. —ED. SEARLES, *Master Mechanic, Darby, Pa.*

### *Will it Pay to Enlarge the Plant?*

In seeking a decision whether to enlarge, the possibility of subletting some of the work should be considered first. If this or night work are out of the question, extension is inevitable if customers are to be retained. What are old customers worth to us, we might ask. A good deal, it would seem, judging by the value placed on goodwill by many concerns. Retain them by all means.

Let your building extensions at any rate be of a temporary nature, and remember that a 50% increase in output doesn't necessarily involve a like increase in supervision, power, and maintenance. There will, of course, be interest and depreciation charges on the new capital and plant to consider, but if things are so brisk that work is being turned away, a return on the outlay should not be long in forthcoming.

It is a bad policy that is content to let competing firms take the work which an extra effort would retain. It seems to me that the old bogey of overhead is the root cause of the fear, but, if we get deep into our minds that the bigger the output the less per unit it costs for overhead, then we get a truer aspect of the case than by regarding overhead as some large sum of money which has to be paid anyway.

—T. H. HARGRAVE, *Bolton, England*

### *How Long Should Records Be Preserved?*

As a matter of self-protection, every company keeps a great amount of old correspondence and other papers filed away. While some of these papers are of great value, the greater part of the filed material is of no value and should be sold as junk. When every scrap of paper is kept, room for storing it is taken up, which could be used to better advantage to earn a profit for the company. Extra help must be employed to do the filing of the papers, thus piling up overhead. While doing this, they can earn nothing for the company, as almost all of the papers they handle concern propositions which have been ended. There should be set up an arbitrary time limit for all papers and correspondence. This dead line may be set at a period of six months, a year, or even slightly longer.

Of course, the proper kinds and number of books should be kept and preserved. Every transaction should be entered into such a record that will show the important points about it. All checks and financial papers should be preserved. The shipping or packing lists and final inspection report should be efficiently filed away. The engineering department should take particular pains with filing research and development material, so that no useless or obsolete information clutters up the files.

—L. O. BROWN, *Toolroom Foreman, Holcomb & Hoke Manufacturing Company.*

### *Sales or Sincerity?*

No sales manager should be allowed to cut delivery dates as furnished by the production manager without first obtaining the approval of the president. If there is neither sufficient time nor opportunity to obtain this approval before booking, the order should be referred to the president before it becomes effective in the shop. This will not only acquaint the president with the facts in every case, but will give him a check-up on both managers, and the opportunity to discover whether either man, or the plant equipment, is at fault. Above all, it will keep both men on their toes and will automatically bring about closer check-ups and more intensive activity, since neither will want to risk appearing at fault in the president's eye. —CHARLES KLYNE, *Foreman, Russell Machine Company.*

# PROTECTION
# for Industrial Veterans

THE TIME has gone by when even small industrial concerns can justly plead ignorance, or fear of increasing and excessive costs, as an excuse for side-stepping the pension issue. Scientific, workable pension schemes have been developed especially for the smaller business and industrial organizations. They have been constructed in such a way that costs are kept within accurate bounds, while positive assurance is given that the pensions promised will be paid in full.

The question is not so much whether a pension plan should be adopted, as how such a program can be operated on a safe and sound basis. That is a bigger problem for the smaller concern than for an establishment having hundreds or thousands of employees. The latter can carry its own pension plan, with some chance of success, if it is so disposed. The smaller employer would find it almost an impossibility to do so. The law of averages does not work in his favor. Payments made to pensioners living far beyond their life expectancy may create an extra expense that may not be offset by an equivalent cost reduction resulting from earlier mortality among others on the retired list. The company with thousands of employees may rely on a fairly accurate performance of the law of averages, while the small concern can not take advantage of it at all.

The smaller organization, with a personnel of less than fifty, must know in advance exactly what the cost of a pension plan will be. Such a concern cannot afford to have its pension expenses show irregular and unexpected rises. They must be figured in advance, in such a way that the employer will never be required to make additional deposits to defray the cost of pensions for John Jones or John Smith, just because he may have happened to live a few years longer than anticipated by the actuarial tables. The employer must be sure that every detail set forth in the pension plan will be carried out. Both the employer and employees must be absolutely safeguarded in every respect if the pension plan is to be safe and sound.

The problem of the smaller concern in setting up a sound pension program has been solved by means of group annuities, which is simply another way of describing pensions established through contract with a life insurance company; this method guarantees the fulfillment of every provision of the pension plan. It eliminates the bugbear of many informal pension schemes—the danger of costs increasing as the plan grows older and the number of employees on pension increases.

It is all very well for an employer to agree to pay a pension, perhaps a percentage of final salary, to employees on retiring at some specified age in the future. While the employer's intentions may be of the best, unless the pension plan has been based on expert calculations and the firm itself has arranged to set aside funds to form a reserve to meet future pension liabilities, he is likely to find himself in deep water, sooner or later.

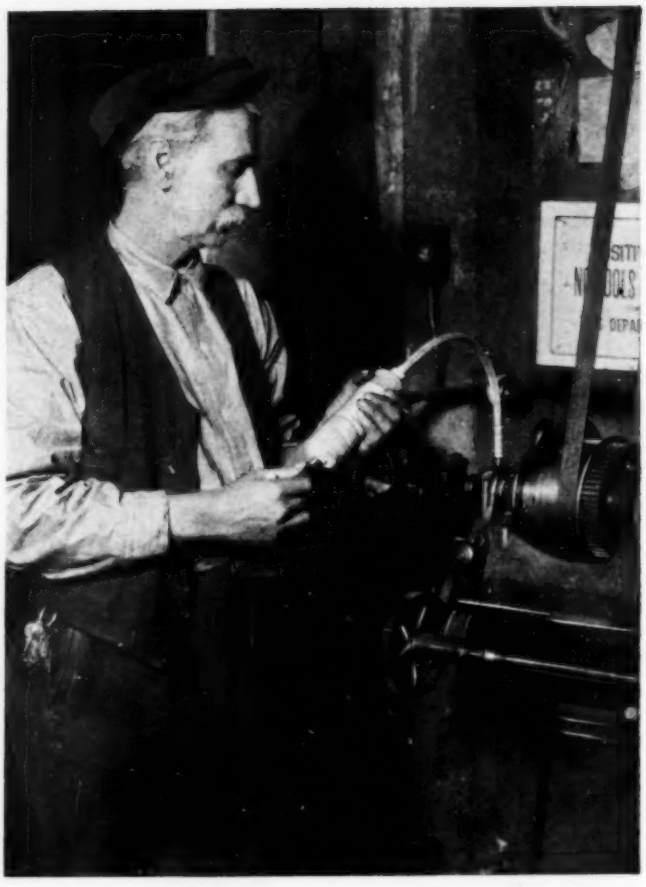
IF a pension plan is set up on a group annuities basis, through contract with a life insurance company it will be constructed along such strong financial lines that all possibility of even partial failure through shrinkage, or total lack, of funds will be completely eliminated. A plan of this sort sets forth exactly what the employer will do, and what the employees are expected to do. It positively guarantees the payment of pensions on retirement at a certain fixed age. And the cost is known in advance.

For these reasons, many of the smaller industrial concerns have adopted insured pension plans or group annuities. Most of them have been installed on a contributory basis, with both the employer and employees making monthly deposits toward a fund used by the

insurance company to buy deferred annuities, based on each year's contributions, that will be paid to the employees in the form of pensions on retirement at some fixed future age.

While plans of this sort are contractual, so far as the employer and insurance company are concerned, the employer reserves the right to discontinue his deposits, or even the plan itself, if unexpected conditions in the future make such a step a business necessity. In spite of this, pensions based on employees' and employer's deposits to date, would not be affected in the slightest degree by the employer's decision. They would be paid at the normal retirement age, just the same.

In putting a plan of this sort in operation, no large initial cost is involved. After signing an application, the employer receives a master contract from the underwriting insurance company which also provides each employee with a certificate acknowledging his rights under the contract. There is no red tape and very little additional clerical work for the employer. About the only responsibility he has, after the plan is in working order, is to see that the employees' contributions, together with his own, are turned over to the insurance company. As the employees' contributions are made through payroll deductions, their collection obviously becomes an easy and simple matter.



OF outstanding importance to the employer is what such a plan will cost him. While that is something which, in the final analysis, he alone can decide, it is of interest to note that by far the largest number of small contributory plans now in effect are operating on a basis whereby the employees' contributions are being matched dollar for dollar by the employer. There is no reason, however, why the employer, if he feels it advisable to do so, may not make his deposits larger and thus increase the final pensions of the employees. In either case, the employer's deposits obviously will vary according to the number of employees enrolled in the pension plan.

Under standard contributory plans, the employees pay either a fixed sum, or a fixed percentage of their salaries, to the pension fund. They may deposit 2, 3, 4, or 5 per cent, or $2.00, $3.00, $4.00 or $5.00 a month. The final pension will depend on the total deposits made by and for the employee, on the employee's sex, and age on entering the plan. The normal retirement age, when the pensions will begin to be paid, is usually set at 65 for men and 60 for women, although there is no fixed rule about this. Whatever the normal retirement age, an employee, by arrangement with the employer, may actually retire before or after such age, with his pension adjusted accordingly.

The earlier in life an employee enters a plan of the sort under discussion, the better off he will be in the way of a pension when the time comes for his retirement. Supposing a young man begins making his contributions when 20 years of age, and has $3 deducted each month from his pay envelope. He will find, on retiring at age 65, that his own contributions have purchased a pension amounting to just a few cents less than $500, which will be paid to him each year throughout the rest of his life. If the employer has matched the employee's contributions, the pension will be doubled, and the employee will get practically $1,000 a year as long as he lives. If the retirement age had been fixed at age 70, the employee would receive, as a result of his own contributions, an annual payment of about $875, which, of course, would be doubled if the employer had been matching the employee's contributions all along.

But the older man is in a less fortunate position. If he doesn't start contributing until 45, and also makes $3 monthly contributions, these will provide him with a pension of a little more than $100 a year at age 65, or about $185 if the retirement age has been fixed at 70. Both amounts would be doubled if the employer had matched the employees' deposits.

As for tying up the employees' money—who is there that isn't provident enough to set aside something for old age, if he is shown how to do so? Even the youngest workers know they may grow old, but they don't all know that they are going to have a competence when old age actually hits them, and they find themselves starting along the downgrade of efficiency. As for death or withdrawal, the employees' interests, as well as those of the employer, are carefully protected. The employee will get back every cent he has put into the plan if he withdraws, unless he prefers to accept a paid-up deferred annuity purchase by his own contributions to date, or chooses to continue, as an individaul, his contributions to the insurance company to build up a larger annuity, payable at age 65, or whatever age has been fixed by his former employer.

Return of employees' contributions in full in case of death before retirement is guaranteed. If death occurs after retirement, the employees' beneficiaries will be paid whatever excess there may be in the employees'

deposits over the total pension payments received by him up to the time of his death.

Nor has the employer anything to worry about, so far, at least, as his deposits made for employees who die or withdraw are concerned. These are either returned to him outright, or are entered to his credit in the pension fund, used to reduce his current deposits, or held intact against the time when business conditions make the current payments difficult to meet. And, what is perhaps of even more importance to the employer, and certainly more important to the veteran workers, these deposits may be used to increase the final pensions of the employees who entered the plan at the older ages.

Furthermore, these released deposits of the employer go a long way toward meeting one of his main arguments against pension plans which involve contributions on his part. It is sometimes claimed by an employer that he cannot afford to keep paying in money for younger employees who probably will have left his service long before reaching retirement age. He may even claim that his turnover is so heavy that not more than a mere half dozen will be still in his employ after twenty or thirty years. Serious as that may or may not be for the business, it has no detrimental effect on the pension plan.

The group annuities system of meeting the pension problem—a plan that is already in operation in many plants and organizations, large as well as small—puts the pension question squarely up to the employer. He may no longer wave the question aside as impractical because of increasing cost or lack of proper information. The plan as described is not only workable, but is even now working to the advantage of many men and women throughout this country, as well as in Canada and the British Isles.

**SEEN · AND · HEARD**

By JOHN R. GODFREY

## *Bicycles and Lubrication in Japan—Shoes or Sandals—One-Man Shops*

BICYCLES swarm the streets and roads of Japan, just as automobiles clutter up our larger cities, and their coming probably displaced many engaged in transporting material by older methods. The bicycle in Japan is a beast of burden that is used to carry amazingly heavy loads of ice, lumber or what not, either directly over the rear wheel or by means of a trailer. But, as with the automobile in our country, many of the men so displaced can probably be found in the bicycle repair shops that are found as frequently as garage repair shops in our country. Two or three men, or boys, can always be found repairing tires, adjusting spokes or otherwise rejuvenating a wheel that has seen better days. As with us, the labor needed to keep the newfangled mechanism in running order absorbs at least part of the men it replaced. Even if it employed all who were thrown out, the increased amount of work secured makes it a profitable investment for the community.

* * * *

FOOTWEAR used in the shops is quite a study. The leather shoe seems to predominate in the larger shops, but there are still thousands who wear the sandal, which has a different name according to whether it has cleats on the bottom or not. Many wear the sort of tennis shoe that we call a "sneaker," but with a "thumb" for the big toe the same as we use on a mitten. This shoe has a thin sole, but is all right for ordinary wear. In bad weather, the "thumb" enables them to slip the cord of a cleated sandal between the first and second toes and so walk high and dry. On the other hand, many wear thin wooden or straw soled sandals with only a cloth "tabi" or sock, or even with none, neither of which seems conducive to safety. But they are of interest because of their difference.

* * * *

THOSE who profess to long for the return of the individual craftsman who works out his own destiny and puts his personality into his work, should go to Japan and stroll down the small streets where such shops abound. One, two, or three men make tinware, forge out small tools, and made wooden window sash or furniture in the good old fashioned way. Skill is evident on every hand, from cutting the recess to inserting the staves of small tubs, to fashioning funnels and stovepipes from sheet metal. The low wage rate that makes this possible prevents a high standard of living, and the discomforts that result are apparent on every hand. It is barely possible that the worker in our country gets more out of life by foregoing so much self-expression, and getting more comforts in the way of warmth and recreation.

# Storing and Mixing Finishing Materials

ALTHOUGH not particularly difficult, certain methods of procedure in storing, mixing and reducing of finishing materials, if followed carefully, are bound to produce the finish originally specified and reduce the amount of defectively finished parts. These fundamentals will tend to maintain a finishing department on an efficient basis.

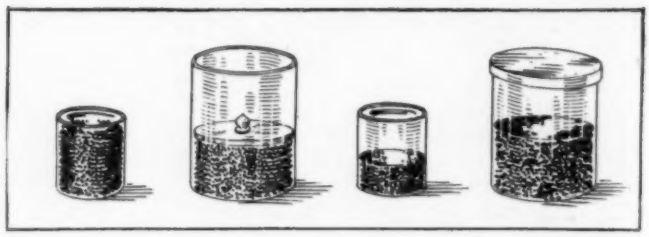
One of the first rules to be observed by any finishing department is to order material in no larger quantity than can be used in a very short time. This is obvious, of course, but not many will stop to think that five gallons of paint should not be purchased if it cannot be used up in one week. Again, do not buy in barrels and drums, unless 50 gallons can be used during one month. To buy in larger quantities than needed for immediate consumption is false economy, even though the larger bulk costs less per gallon, because of the unnecessary tie-up of capital and the danger of deterioration after the containers have been opened. Upon delivery, finishing material should be placed immediately in a storeroom maintained at 60 deg. F., or more.

Most finishing materials contain pigment incorporated in the vehicle, which may be either varnish or lacquer. This pigment is necessary to give color, hiding power, and a definite degree of luster to the finish. Since pigments are heavier than the liquid reducer, they have a tendency to settle. It is absolutely necessary to mix pigmented products thoroughly every time they are used. Such materials are: flat varnishes; white, black and colored enamels; pigment black japans, rubber finish japans; clear flat lacquers; colored lacquers; pigment pastes and semi-pastes. Clear varnishes and clear lacquers contain no pigments and need no mixing nor reducing before drawing.

BESIDES mixing the pigmented product before using, it is also essential that this work be done thoroughly, using the methods best adapted to the particular container. If mixing is incomplete, the product will be thin on top and thicker on the bottom, and the color will be off shade. The luster of the finish obtained will be too glossy or too flat—depending upon whether the material is taken from the top or the bottom. The hiding of samples from the top will be poor, whereas from the bottom it will be better than standard.

Finishing materials provided in cans can be mixed by hand satisfactorily, but in drums it is particularly desirable to employ mechanical mixing to assure the best dispersion of the pigments. The mixing of paint by hand in cans and barrels is shown in two of the accompanying diagrams, but there are certain features of mixing finishing materials in barrels which should be

Diagrams and general information by courtesy of the Hilo Varnish Corporation.



**Right** **Wrong**

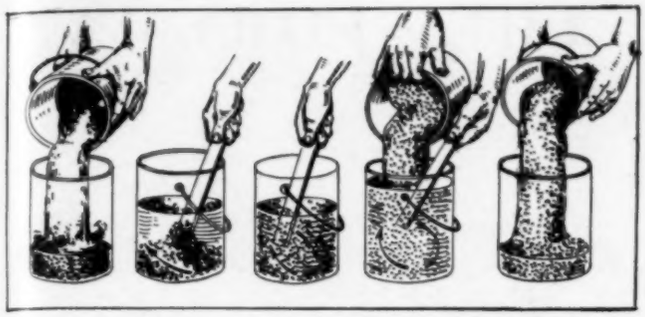
**The containers must be full, or closely fitted covers must be placed on top of the liquid to prevent evaporation of the thinner and oxidation of the drying oils**

understood. In mixing material in a barrel, it is necessary to take off the cover or head and then employ a strong paddle, about 6 in. wide and 2 ft. longer than the barrel. Mixing can be greatly aided by taking off about one-fourth of the contents, mixing the remainder thoroughly, then adding the part previously drawn off, and mixing again. This procedure applies to cans also.

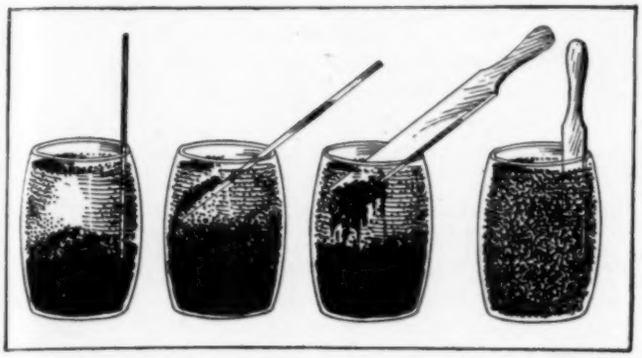
WHEN mechanical mixing is employed, the original container can be placed under a stationary mixing device, or a portable mixing device may be inserted through the opening at the top. Sometimes it is advisable to employ a special tank for the mixing device, in which case the contents from the original barrel or drum are emptied into a tank and mixed thoroughly. Where the material to be mixed has settled appreciably, it is advisable to take off the lighter portion from the top and put the heavy portion from the bottom in the mixer, mix thoroughly, and then add the lighter portion gradually until the whole mass is uniform.

As received, finishing materials are usually of a consistency or body that is heavier than the body required for use. This gives flexibility in its use, and in pigmented goods, lessens the amount of settling. Such materials must be reduced before use, and if pigmented, must be thoroughly mixed before reduction. The reducer should be added slowly and gradually, meanwhile being stirred vigorously to insure quick and thorough incorporation. When a large quantity of reducer is added at a time, it will float on top and require much longer to incorporate than when added gradually. If not thoroughly mixed, reducer may cause a separation, which will give a gritty appearance to the finished work. Both the material to be reduced and the reducer should be at nearly the same temperature, preferably over 60 deg. F. In no case should lacquer thinner be employed in oil products nor enamel reducer in lacquer products, since they will not mix properly in most cases, and may cause pock-marking.

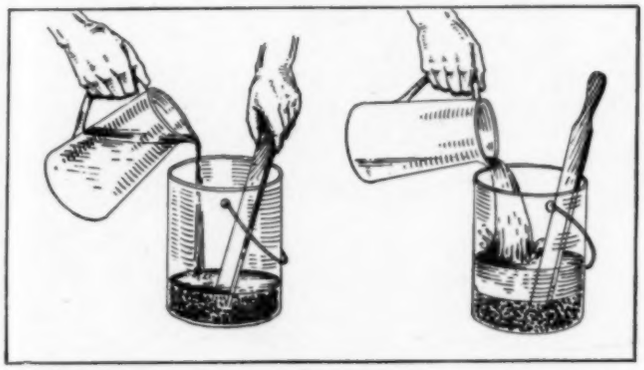
Reduced pigmented materials should be kept thor-



**Mixing finishing material in a can is done more thoroughly and with less labor if most of the thinner is poured off, the remainder mixed, and the thinner added gradually during stirring then "box" thoroughly**



**Above is the correct procedure for mixing a barrel of paint. Save labor and get better results by using a machine**



**Reducer must be added to thickened finishing material gradually during stirring, in order to insure incorporation and to prevent the formation of a gritty deposit**

oughly stirred while in use. Unless the pigments are uniformly distributed throughout the mass, the correct tint or shade, the correct luster, and uniform hiding of the material will not be obtained. Reduced material which has thickened, because of the loss of volatile thinner during exposure, will require further reduction. Dip tanks should be stirred frequently while the tank is in use to assure uniformity at all times. It is also necessary to add reducer daily to replace evaporation, and at the same time to freshen the mix with new material and reducer to replace that used. Closely fitted covers should be applied to dip tanks when not in use, and they should be kept air-tight. These covers should be placed close to the surface of the liquid in order to prevent a scum of oxidized oils forming on the material.

With a little practice it is possible to obtain accurate and reliable information as to thoroughness in mixing by means of the following method. A few drops of the finishing material are taken from the very top of the container, together with a few drops from the bottom, and are placed on a clean piece of glass. If the drum or tank has no faucet at the bottom, a sample may be obtained by taking a long rod or paddle and putting the tip down to the bottom and then withdrawing. After permitting the paddle to drain for a minute or two, a little of the material from the extreme end which has been in contact with the bottom of the container is placed on a clean piece of glass. If the samples from the top and bottom are identical in color and covering, the material has been properly mixed. Color can be compared by looking at the glass, whereas the covering can be compared by looking through the glass. If the samples do not match, mix the material again and repeat the test. By inclining glass and placing the drops at the upper part of the incline, information as to consistency may be obtained by noting the flow down the incline during a certain period of time, such as one minute. This test is equally effective in checking both the uniformity of goods in the original container and of reduced materials.

## Specifications for Customers' Orders

By Charles H. Willey

*Assistant Plant Superintendent, Hoyt Electrical Works*

A VERY definite saving has been effected at the Hoyt Electrical Instrument Works by establishing specification sheets to record permanently the requirements of customers' special needs. Samples of these specifications are shown in the accompanying illustration. Customers have a habit of ordering from catalogs and salesmen, and of giving only the type and number of the instrument they wish. Nearly always they want a special dial printed, with the company name, and having a special calibration of the meter, some special finish, size, and length of screws, or similar part different from the standard piece. Special material is now put on a specification sheet when the first order from a customer is received, and the sheet is filed. Duplicate orders from the purchaser can be filled exactly as he wishes them, merely by referring to the sheet. When a factory order is issued to build the instruments, the regular standard

| HOYT ELECTRICAL INSTRUMENT WORKS, PENACOOK, N.H. | Dwg.No. SA-64 |
|---|---|
| Material | K. B. W. Ford |
| Tools | Magneto Tester |
| Date Drawn By | Scale |

Specifications

1. Type 517
2. Dial A-3103
3. Base A-3065
4. Cables 3' long with Eureka clips
5. Resistance of coil .019 ohms
6. 10 strands of #23 cotton covered wire 5' long

Do not take this print from stock room

SA-64

parts are put up in the quantity needed, and to them are added the special pieces that the specifications call for. This results in a minimum of delay in manufacture and assembly, and the customer gets just what he wants.

*The following narrative is a "case" presentation of the topic. It has been written to involve some of the questions that arise in the average shop. For guidance in preparing discussion the questions given at the foot of the page have been arranged*

# The Chain Store Problem

"I DON'T want to be critical, Al, but I wish you would chase my men out of your department when you see them hanging around," remarked Ed at lunch.

"I certainly will, or anyone else's men either, but what makes you think that I allow meetings to be held in my department?"

"There you go, you're getting awful touchy lately, I never said a thing about meetings, I am only trying to tell you in a nice way that since another of your men started in the store business, my men 'make a beaten path to his door,' as one of the shop mottoes says, and I am going to put a stop to it."

"Store business? I suppose you refer to the fact that I gave Roy Broadwater permission to sell candy and tobacco?"

"I sure do, and now that you mention it, I consider it a reflection on my judgment in regard to not eating during working hours, and not only that, but it demoralizes every other department in the plant."

"Pretty strong statement, big boy, and expressed with considerable feeling. Do the other foremen feel the same way about it?"

"I am not talking for them, I'm talking for myself. I think you are indulging those men of yours like a lot of spoiled children."

"Not meaning to be short, Ed, that's my business. The department as a whole seems to compare favorably with others, so what difference does it make if someone does sell something?"

"None perhaps, if confined to your own department, or outside of working hours. Otherwise, men lose a lot of time going back and forth. We have too darn many merchants."

"What do you mean by too many? I only know about Roy. Are there some others?"

"Well, we have two or three that sell butter and eggs, one sells tea, one sells tickets for the base ball pool, and now comes another one selling candy and tobacco. It gets my goat, and something's got to be done."

"I did not know about the rest of these shop merchants. Are they all my men?"

"Not all of them are, but none of them are in mine, and they're not going to be either. If I can't settle the matter myself, I am going to put it up to Williams."

"That's your privilege, Ed, but suppose Roy did not sell tobacco to the boys, they would borrow from the others and waste just as much time."

"Not on your life they wouldn't. The O. P. brand of tobacco is good, but the supply is limited. You can touch a stranger once, and a good friend, maybe twice; but beyond that, they will ask you why you don't buy some. I'll bet you can't name a 'tobacco bum' in the whole plant."

"Maybe that's so, but I can't see any harm in letting a man sell stuff providing it does not hold up work. I am even in favor of having a push cart go around, if the men want it."

"Yes, 'milk from contented cows' stuff! You are a good mechanic, Al, and a good organizer, but when it comes to handling men, you put other foremen in bad by being too indulgent. I have one man who wants to sell tobacco, another who wants to deliver bottled milk, still another who wants to take orders for vegetables; and each asks for it, not as a privilege, but as a right because you let your men do it. But I refuse to be blackmailed."

***When each foreman is free to make rules within his own department, how can a neighboring department protect itself? With each man having equal rights, on what basis shall privileges be granted?***

Contributed by W. J. Owens, Foreman, Newport Rolling Mill Company.

Foremen are invited to discuss these questions vital to their work; of course the

# DISCUSSION OF EARLIER TOPICS

### Learning from the Small Shop

THERE is an advantage in learning from the small shop because of the fact that it is usually not able to expend as much money, in proportion, for special tools and fixtures as the larger shop. Therefore, the small shop will, of necessity, resort to methods which are cheaper, and sometimes just as efficient for a limited production.

Of course, good judgment in the processing of work must be used, and the tool estimator should consider the quantity of pieces to be made.

—HERMAN F. FIEDLER, *Foreman, New Era Manufacturing Company.*

*

### Compulsory Membership in the Mutual Aid

MUTUAL aid societies are well worth while, but are not so important as to make membership a condition when seeking a job. Many men belong to several fraternal orders and carry life insurance, which is about all they can afford.

One drawback with factory mutual aid organizations is that membership usually terminates when the man leaves that company. The feeling is that by putting the same amount of money into a fraternal society he can stay a member as long as he likes regardless of where he works. Also, social features are lacking in factory societies.

—L. F. SWENSON, *Industrial Engineer, Perkins Machine & Gear Company.*

*

### Raising the Working Efficiency

I WOULD not like to see a special instructor in my shop, because I think it is my task to be the instructor of my foremen and men. At the beginning of my shop experience I found opposition, but I missed no occasion to be at the front in every difficult job, by which I could prove that I was big enough to compel the desired result. On the other hand, I told my foremen that I am always studying German, English, and American periodicals, in order to be in close contact with improvements made in shops all over the world. I also told them that they should come to me with their problems, and for many years I have solved our problems hand in hand with foremen and workers.

—FRANZ BERMANN, *Supt. Locomotive Shops, Austro-Hungarian State Railway, Vienna.*

### Who Shall Be Laid Off First?

THE highly priced man is the one who is most difficult to replace, and the man who can most easily find other work. Perhaps with competitors. One can hire and fire laborers as required, with little trouble from the constant change over, but good jig and tool makers, die sinkers, automatic set-up men and the like are difficult to find, and once found should be retained even at a temporary sacrifice. A high-grade man will appreciate continuity of employment and is not likely to mind doing, for a period, other work requiring less skill. Far better that than a week or so of unemployment. Further, a man so treated would tend to be loyal to his employers if tempted to go elsewhere when times became better. The highly paid man is usually the key man, without whom the others could not be employed to full efficiency.

—C. NORMAN FLETCHER, *Cheshire, England.*

*

### A Bonus for the Ambitious

HAVING spent more than one year in making a study of correspondence schools for the Carnegie Corporation, will you please permit me to present some of our conclusions?

1. There is no systematized form of vocational instruction available today for adult workingmen upon as economical a basis as that offered by the correspondence school.
2. Some of the best vocational literature available in the English language is to be found in the text material of some of these schools.
3. The better correspondence schools spend thousands of dollars annually in keeping their texts up to date.
4. More than 5,000 industrial and commercial corporations today have some form of contractual relations with home study schools to furnish instruction to their employees, because it has been found to be mutually profitable.
5. The National Home Study Council, Washinton, D. C., is an inspecting and accrediting agency for home study schools, and they will gladly send a list of approved home study institutions to any one stating the kind of vocational courses in which they are interested, and accompany it with a self-addressed stamped envelope.

—J. S. NOFFSINGER, *Ph.D. Director, National Home Study Council.*

*

### New Drills and Old Men

THIS problem, which has recently arisen, has been taken care of in a large Eastern machine shop in a manner quite satisfactory to all. New machinery of the semi-automatic type had been purchased, and the men, especially the "old timers" had the idea that it meant more work and less pay, so they were very much agitated. There had been quite a lot of talk of "I won't do it, I'll quit first," from the men.

The superintendent called in the foreman of the department, and asked him how he was going to get the

discussion is not limited to foremen. Letters accepted and published will be paid for

machines started without causing hard feelings. The foreman assured him that when the machines were ready he would have them operated without any trouble, but the super seemed to fear that trouble would result. Finally, the machines were delivered, set up, and tried out. The foreman took one young fellow, assigned him to operate two machines. The young man went to work with a will and from the first day he made better money than ever before.

The old timers began to get restless about the pay the "kid" was making and told the foreman so. His reply was, "Any of you men can do the same any time you want to try the new machines. I am not forcing anyone to run them, and only men who want to make money will be allowed on them." At the end of a month all the machines were being operated by the old timers, and they were happy too.

—CHARLES R. WHITEHOUSE, *Chief Time Study, The Holtzer-Cabot Electric Company.*

*

## Who Shall Be Laid Off First?

SOME employers, for instance tool makers, instrument makers, and precision machine builders, who employ only the best men that they can get, will hesitate before allowing any of their employees to quit, let alone putting them off. In times of stress, the working week should be shortened to keep all hands on the pay roll. For a different industry, it might be found more beneficial to put off semi-skilled operators who could be rehired when work begins to flow again, keeping on the more skilled tool setters at full or part time. This policy is dictated by the quantity of labor available in the vicinity. If skilled and semi-skilled labor is difficult to obtain, judgment should be used whether a quick recovery of the order book might not be impaired because of inability to obtain sufficient labor in the time available. Where the labor is dependent on one firm, as in many small districts, the works naturally has the best of the deal and can lay the various categories off as best suits the pay-roll. —JAMES R. CORNELIUS, *Coventry, England.*

*

## Learning from the Small Shop

IN THESE times of intense competition, the small shop can exist only by furnishing the goods required, at a lower price or by better deliveries, than the big shop. The principal reason that many small shops can do both of these things lies in the fact that they do not tie up a lot of money in special tools.

The above was brought forcibly to my attention recently, when inquiries were sent out on two special machines. One large up-to-date plant quoted $850 each, with an extra charge of $450 for special tools. A small jobbing shop quoted $930 each, with a charge of $75 for special tools. The big shop asked to have the blue prints show limits on every dimension, while the small job shop was able to build the machines from the fractional dimensions shown on the blueprint.

The big shop should not be condemned for these things. In the first place, the big shop would have to pay for tool designing, pattern making, and tool-making, on the special tools required. The small shop man, went down to the scrap shed, behind his foundry, and picked out various odds and ends.

When it came to limits on all dimensions, the big shop needed them, so that machine operators and specalists could do the work satisfactorily, while the small shop owner could follow the job personally, and he used all-around men on the job, who knew the proper fits.

It is by such methods as the above, that the small shop exists. While the big shop may get by on its reputation and financial connections, the success of the small shop depends mostly on the ability to cut corners. Economy and resourcefulness are two lessons which the planning and engineering department of big shops may well learn from the small shop. —H. M. DARLING, *Engineer Wells Tap & Die Company*

*

## Smoking During Working Hours

SMOKING is not a necessity, but a pleasant habit for many people. Why, then, should it be tolerated by a man working at or among machinery? Neither officers, office force, visitors nor anybody else should disobey the ruling of "Smoking Is Prohibited."

I know it is allowed in English factories. In many up to date factories in this country, parts of certain buildings are set aside for this practice. The attention necessary to enjoy a pipe or cigarette makes it a prohibitive practice in manufacturing departments. A factory rule should mean the same to everybody.

—SIGURD C. NIELSEN.

*

## Advising Employees About Their Affairs

A COMPANY'S policy in matters involving employees' personal affairs is of great importance. Assistance or advice tactfully administered will do much for the morale of the workers, but irritation will be produced simultaneously with the impression that the company is interfering.

The line of demarkation is not always easily defined, since each individual case must be judged according to its merits. A man's character, the nature of his difficulties, and his value to the company are points which must affect a wise decision.

The establishing of precedents must also be carefully watched; for instance, the company who furnishes legal aid for an employee in an automobile collision might find itself deluged with requests for similar service, which, if granted, would keep its legal department busy. Employees should be encouraged to bring their problems to the management, and a receptive attitude will quickly create a spirit of confidence. The company will then seldom be compelled to take the initiative, and the danger of objectionable paternalism will be eliminated.

—GILBERT G. COOMBS.

## THE · NEXT · TOPIC

*"No Verbal Orders Accepted"*

# Bulging and Flanging Shells

**There are at least two ways of bulging a metal shell. One is by fluid, the other is—**

By CHARLES H. WILLEY
*Asst. Plant Supt. Hoyt Electrical Works*

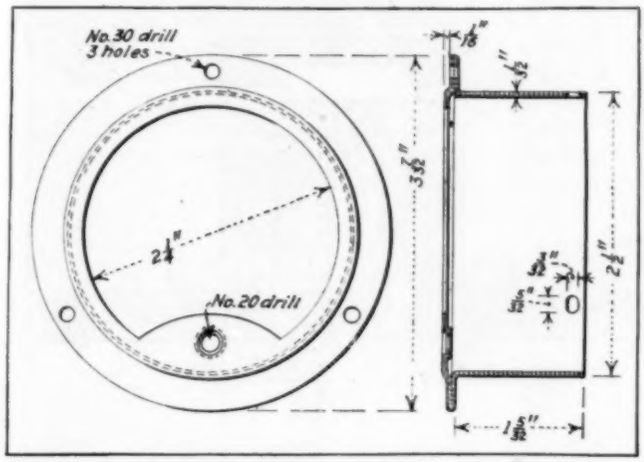



**Fig. 1—Meter case for which the tools, described in this article, were made**

IT IS not claimed that the tools shown with this article are the last word in tool construction as a large industry would make them. They do represent the combined ideas of the staff of this company, and if there are better methods in use we would welcome an article describing them.

Our requirement was a wide flanged meter case such as is shown in Fig. 1 and at *E* in Fig. 7; our problem was to upset a flange $\frac{3}{8}$ in. wide.

One of the handicaps that we, in common with many small shops, labor under, is the lack of equipment. That which we have can be used and is mechanically good, but it is not always economical of operation, and the costs must be judged with that factor in mind.

The largest press we have has a $3\frac{1}{4}$-in. stroke. This does not permit of blanking and drawing a shell $2\frac{1}{2}$ in. diameter by $2\frac{1}{4}$ in. long. It is necessary therefore to blank, draw, and redraw, making three operations instead of one.

The blank is 5 in. in diameter and is punched in the

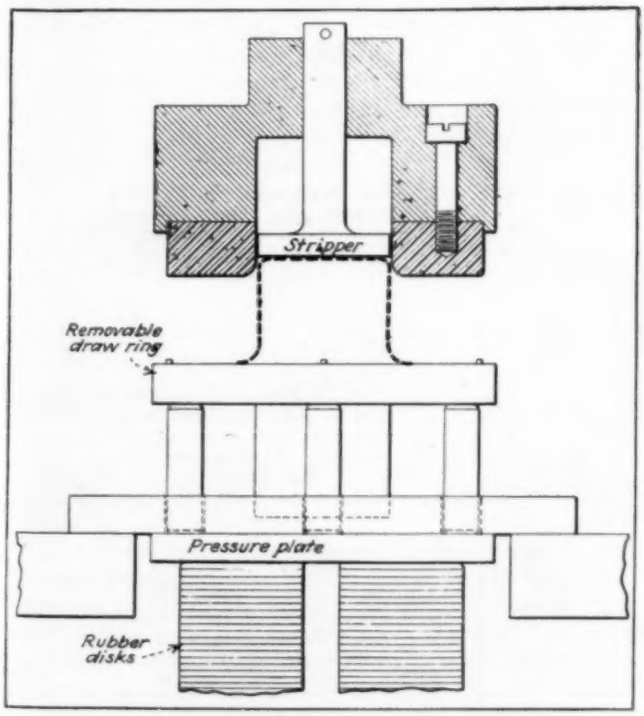
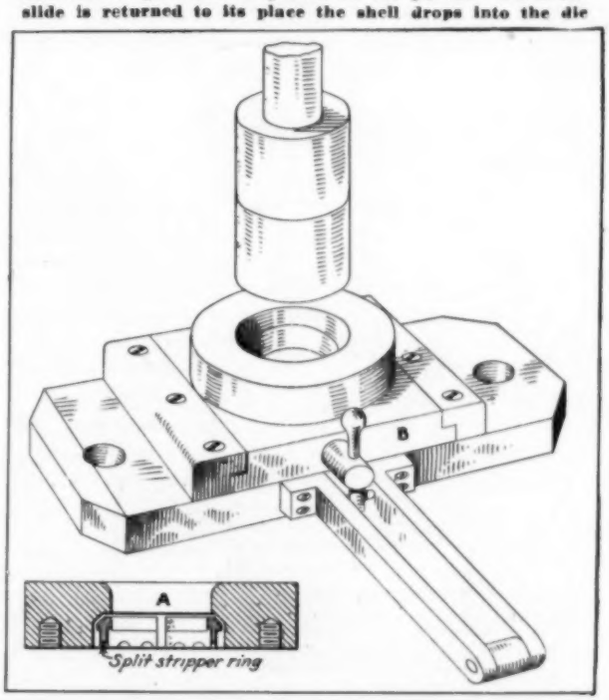



**Fig. 2—Inverted die that only partially draws the shell because of the limitation of stroke**

**Fig. 3—To finish draw the shell, the slide B is pulled out, and the flanged shell is placed on the punch. When the slide is returned to its place the shell drops into the die**



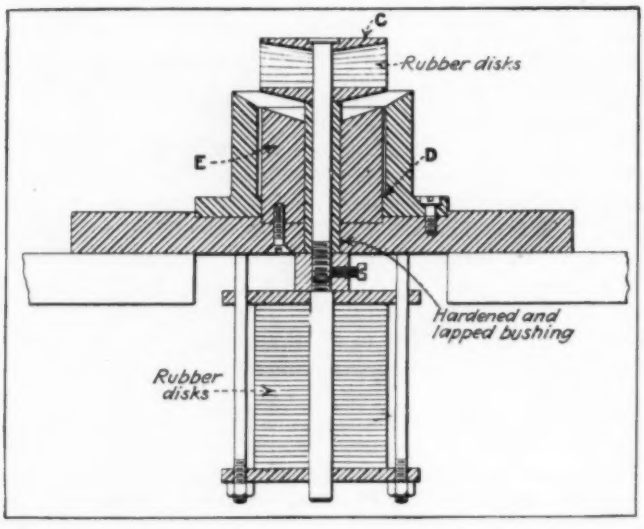
ordinary way. The blanks are then drawn as long as possible in the inverted drawing die shown in Fig. 2. The shell is removed by lifting the drawing ring. This allows the shell to come clear by tipping it. The ring is then replaced for the next blank. The shell when removed has the shape shown at *A* in Fig. 7.

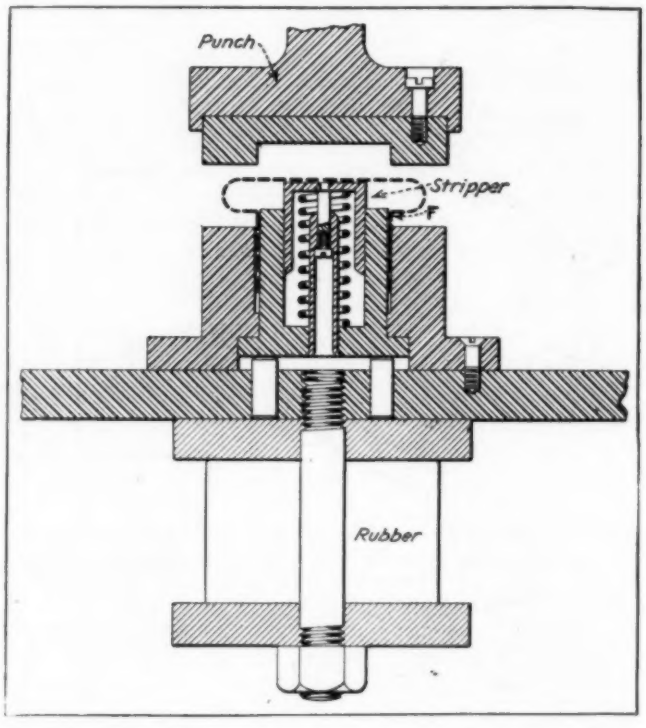
It may be thought that this is a troublesome and expensive way to do the job. Why not buy a larger sized press and do it at one stroke? The reason is that the job did not promise enough in quantity to warrant the expense of investing in a larger press that we might or might not have use for in the future.

The next operation is to finish drawing the shell in the tools shown in Fig. 3. Here again we had to improvise, this time a sliding draw plate *B* in order to accommodate the work in the press. The method used to strip the shells from the punch after they have been pushed through the die is shown at *A*, Fig. 3, it being a spring-tempered split ring of the sectional appearance shown.

The next operation is that of bulging the bottom of the shell to gather stock for the flanging operation. The tools for this are detailed in section at Fig. 4. The shell is placed on the rubber expander *C*. The flat punch descends and pushes the shell down to the seat or shoulder *D*, simultaneously the rubber expander is seated in the plug *E*, and of course as the rubber is compressed it expands outward, bulging the shell to the shape shown at *C* in Fig. 7. The expander shaft or arbor is hardened and ground, and the bushing or sleeve that supports it is hardened and lapped. The shell is loosened after its bulging, by the stripper pad below the press, which is made of thin disks of rubber.

The next operation is performed on the tools shown in Fig. 5. The sectional view of the die is shown. The bulged shell is placed over the plug *F*, locating or bottoming on the shoulder when it is pressed down by the



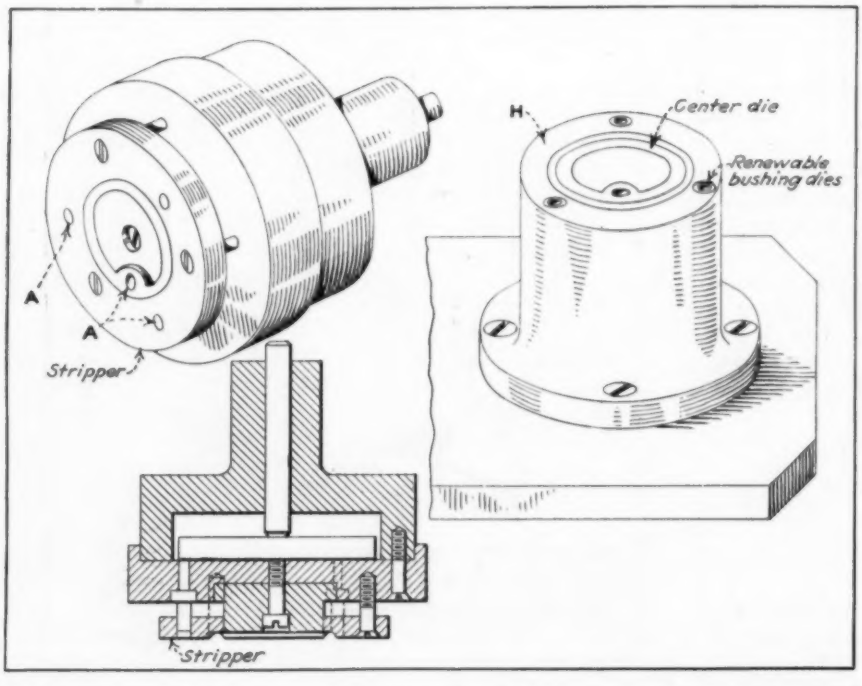




**Fig. 4—Upper left. Die for bulging the bottom of the shell preparatory to flattening it**

**Fig. 5—Above. Cross section of flattening die, showing the method used for stripping or loosening the flattened shell**

**Fig. 6—At the left. Punch and die for punching the bottom and perforating three holes in the flange**

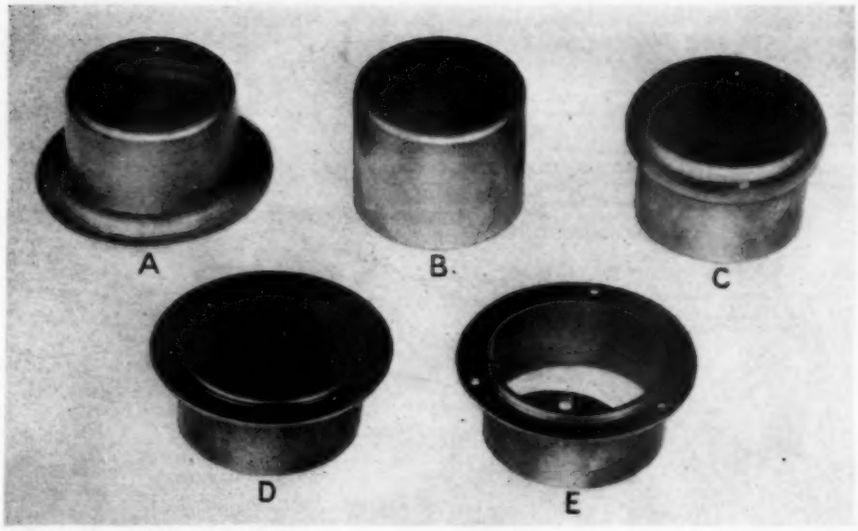



**Fig. 7—The various major operations on the meter case. Note the uniformity and symmetry of the bulging**

punch. The result of this operation is shown at *D*, Fig. 7. The next, and last, operation is that performed on the tools shown in Fig. 6, cutting out the center and piercing four holes. The flanged shell is placed in the die over the center die, and the flange is supported by the outer die *H* which has three renewable bushing dies. The punch then cuts the center to shape and pierces the four rim holes. The work is removed by the stripper. The results of this die are shown at *E* in Fig. 7. The material used for this meter cover is $\frac{1}{32}$-in. deep drawing brass. No annealing is done during the complete process.

A run of 1,000 pieces demonstrated that the tool design was good and that they were not unreasonably expensive to operate. The actual labor cost for all the operations shown, including blanking, was 75 cents per hundred pieces, and right there we have the answer as to why a larger press was not purchased. If half of the direct labor was saved, it would require an order of more than 50,000 covers to justify the purchase of the new press, on the principle that a new machine must save ten per cent of its cost on the order for which it is purchased.

A description as to how these same parts have been made in a big plant, would be interesting.

# German and Skoda Tolerances Compared—*Discussion*

By N. N. Sawin
*Research Engineer, Skoda Works, Pilsen, Czechoslovakia*

AMERICAN MACHINIST, Vol. 71, pages 887-889 contains Professor Schlesinger's "last word" on "German and Skoda tolerances compared—Discussion." I do not intend to continue the discussion further, but in the interest of truth I wish to point out some misstatements concerning my claims, and some unfair comparisons contained in above article.

I have never claimed that the Skoda limit system does not require any experience on the part of the workman, as stated by Professor Schlesinger. I have only pointed out that the system excludes the necessity of special arrangements and instructions in such fits as medium force fit, Festsitz, which in the DIN system often yields a snug fit instead of a tight one.

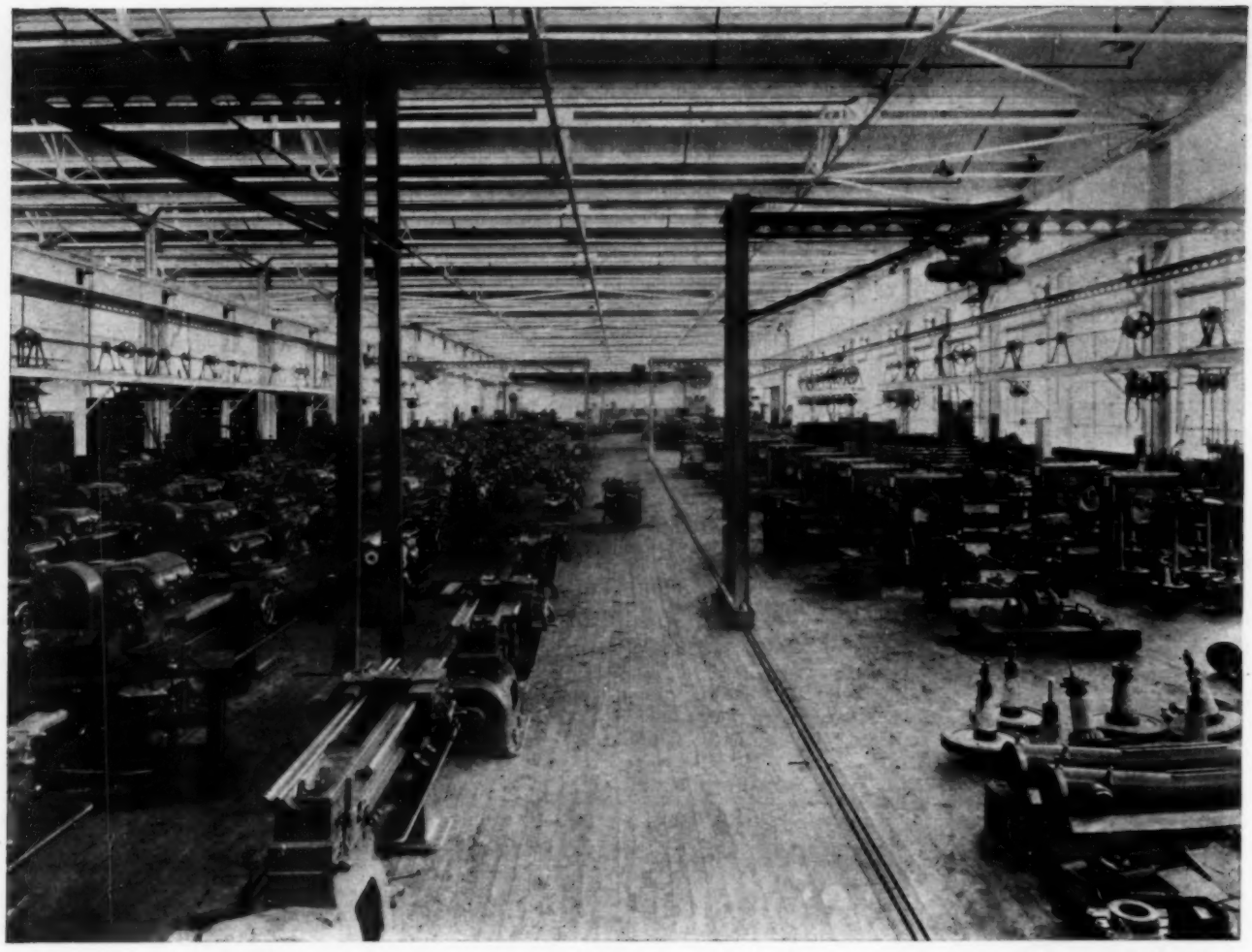
If Professor Schlesinger had carried out experiments 10 and 12 according to corresponding figures of the DIN system, he would have obtained a clearance of 7–11 μ (7 according to DIN tables + 4 due to deviation as in his experiment). This clearance cannot guarantee a force fit.

I did not intend to correct the shortcomings of the second grade DIN with the third grade Skoda, as it is obvious that with increased limits, both of bore and shaft, interferences and clearances will be subject to greater variations too. Insufficient definition of transition fits and of the Festsitz (Medium Force Fit) of the second grade DIN has been corrected in the second grade Skoda by a reduction of limits. The correctness of this step has been confirmed by the fact that the International Commission has adopted for the second grade smaller shaft limits than prescribed by DIN. Subsequently this grade has been recommended by Professor Schlesinger and Dr. Kienzle, members of the German Delegation of the ISA.

The graphical comparison of both systems (Fig. 2 of Professor Schlesinger's article) is fundamentally incorrect because the numerical values of different grades are compared. Besides that on one side are the DIN figures *without* the possible increase due to wear and manufacturing limits of gages, and on the other side Skoda figures *with* this increase. There is obviously some misunderstanding somewhere.

The pressures referring to third grade quoted by Professor Schlesinger are not likely to occur in actual practice, because the third grade is based on coarser finish than that which was put on his test pieces. I wish to state once more that the third grade is intended for shops that, on account of equipment limitations, cannot work in the second or finer grade.

Every employee having occasion to work near oxygen tanks should be warned of the explosive properties of grease or oil when brought into contact with oxygen



New assembly shop of the Hendey Machine Company. Lathes are assembled on the left side of the aisle and shapers on the right

# The Gantry Moves Indoors

## HENDEY OPENS NEW ASSEMBLY SHOP

TO FACILITATE its extensive operations in the producion of lathes and shapers the Hendey Machine Company recently has completed a new addition to its plant in Torrington, Conn. The main new unit is a single-story saw-tooth roof building measuring 410x80 ft. and now is in use as an assembly department. This building is heated by means of a number of York unit heaters.

A craneway runs the full length of the building and is provided with a ten-ton P & H electric crane. Below the main craneway seven gantry-type Cleveland tramrail cranes fitted with electric hoists are used. Four of these cranes serve one side of the floor, where lathes are assembled, and three the other side, where shaper assembling is done. At the inner ends of the gantry cranes are A-shaped frames supported upon two wheels running on flush floor rails at each side of the center aisle. The gantry cranes are traversed by hand. This unusual arrangement makes a particularly convenient method of handling parts and complete machines.

Joining the new assembly building to the older portion of the plant, which continues in active use for machining parts and making sub-assemblies, is a new storeroom measuring 126x30 ft. Into this storeroom are fed all sub-assemblies and other parts needed for final assembly of the complete machine tools manufactured. From the storeroom, parts are issued as needed and transferred to the assembly floor.

Assembled machines are carried by the overhead crane to one end of the assembly floor, where they are painted and crated for shipment, adjacent to a new railway siding which terminates in the building.

Incoming material entering the plant on another siding, is placed in stock convenient to foundry and machine shops, including a large planer shop, housed in a separate building as heretofore. Certain departments have been rearranged to accommodate some new machinery and to utilize space formerly employed for storage and assembly.

Other improvements include a new 300 hp. B & W boiler serving a new Westinghouse 500 kva. turbo-generator for supplying current at 440 v.a.c. which marks the first step in converting the shop from a d.c. to an a.c. basis.

# IDEAS FROM PRACTICAL MEN

*The department, "IDEAS FROM PRACTICAL MEN," is devoted to the exchange of information on methods useful to the machinery industries. Its scope includes all divisions of the metal-working industry, from drafting room to shipping platform. Descriptions of methods or devices that have proved their value are carefully considered, and those published are paid for. The rates are from a minimum of five dollars upwards, depending upon their merit.*

## Spacing Device for a Milling Machine

BY MATTHEW HARRIS

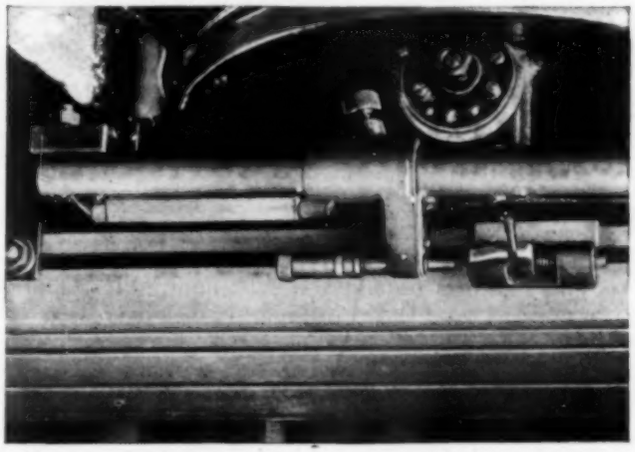
FOR SPACING and for boring holes having accurate center distances, such as in jig plates, the table screws of milling machines are not accurate enough. While milling machines are generally fitted with vernier scales when they are to be used for such work, the device shown in the illustration is more positive than a vernier scale, because it eliminates the chance of errors in reading.

The device consists of a block fitted to slide in the dog slot of the table, and having one stationary and one spring-actuated contact point, the tail of the latter extending slightly beyond the block; a bar attached to the knee and fitted with a contact point near one end; a movable bracket having a contact point opposite the one on the bar, and carrying a micrometer head in an extension at the other end.

After the table has been set for the point of departure, the bracket is moved so that its contact point is against the one on the bar. It is then locked in position by means of the knurled head screw on its under side. The block in the dog slot is moved so that the projecting tail of the spring-actuated contact point touches the end of the micrometer spindle, and is then locked. The micrometer spindle is then adjusted so as to push the spring-actuated contact point away from the stationary one, leaving an opening sufficient to admit the entrance of a feeler gage with the proper feel. With everything so set, the first mark is made, or the first hole is drilled.

For making the second mark, or boring the second hole, the table and the bracket are moved to the left and a gage having a length equal to the length of the first space, or the center distance between the first two holes, is inserted between the contact points on the bracket and the bar. The bracket is then moved to hold the gage firmly and is locked by its screw. The table is moved to the right until the tail of the spring-actuated contact point in the block touches the end of the micrometer spindle, continuing the motion until the spring-actuated contact point is pushed far enough from the stationary one to insert the feeler gage between them with the proper feel.

For the next position, the same procedure is repeated, with the exception that the gage inserted between the contact points on the bracket and the bar must have a length equal to the distance between the first two spaces, or the center distance between the first and third holes.



**Device for accurate spacing**

It is understood that the micrometer head is not adjusted after its original adjustment at the point of departure, unless a gage of the exact length as the distance between spaces, or holes, is not at hand. When it is necessary to use such a gage, the micrometer can be adjusted to make up for the deficiency before moving the table so that the tail of the spring-actuated contact point touches the end of the micrometer spindle.

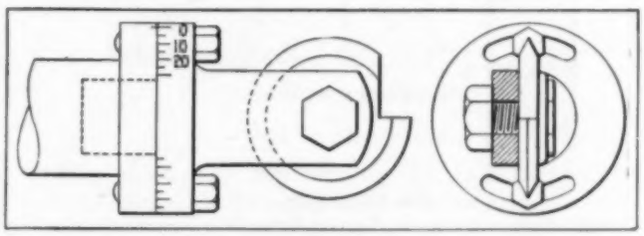
A device embodying the same principles as the one described can be applied to the vertical slide of the machine, thus providing for spacing in a vertical direction. With both such devices in use, a milling machine can be converted into a very accurate jig borer for work within its limits.

## A Tool for Cutting Precision Threads

BY T. W. HOBBS

*Birmingham, England*

Many difficulties are encountered in cutting fine double, triple, and quadruple threads for precision purposes, such as scientific instruments, taps, and hobs. The writer had difficulty in producing accurate double-depth, fine



**A circular cutter and swiveling holder aid the production of fine screws**

V-threads in hard cast steel, especially multiple threads.

The trouble lay in getting the tool in exact pitch again after grinding and in getting the different leads all the same. This was overcome by the use of a tool with a circular cutting section and a holder with angular adjustment. The usual method of setting the tool by an angle gage was used. The readings on a graduated scale on the toolholder were recorded, making it possible to obtain precisely the correct setting, when the same thread was cut again. The height of the tool point may be adjusted in relation to the lathe centers by loosening the clamping nut and slightly revolving the tip.

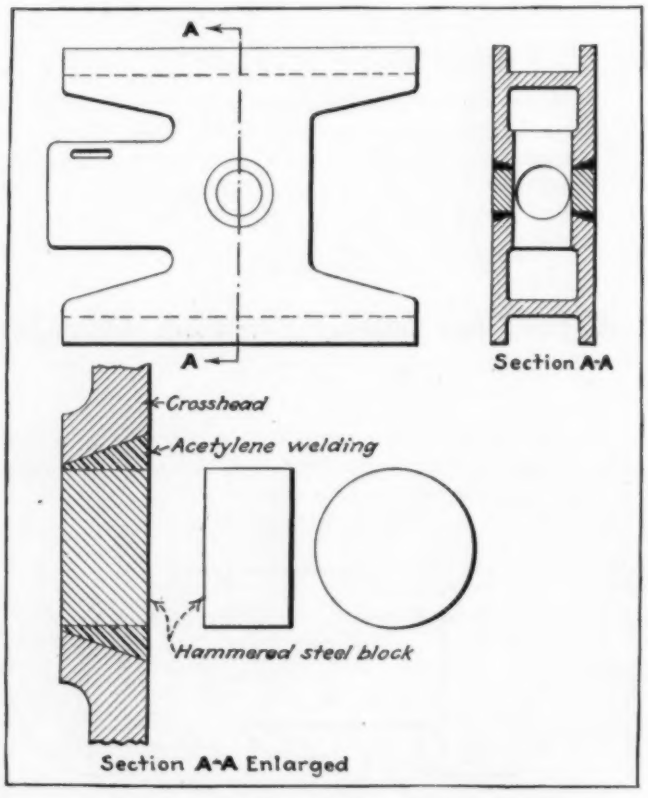
The writer has had twenty-three years' experience in producing screws for astronomical, gunsight, and other intricate mechanisms. The tool described was found extremely valuable on work of this kind.

## Reclaiming Locomotive Crossheads

By J. H. Hahn

The wristpin holes in locomotive crossheads gradually become enlarged beyond the safe limit, this condition being due to wear and re-reaming in making repairs. It is well to have a limit for the size of these holes, otherwise there is a possibility of the crosshead becoming weakened by their enlargement, eventually causing failure with the resultant damage to other parts of the locomotive. If the standard size of the wristpin holes in new crossheads is 5 in., the limit for increasing their diameters should not be more than $\frac{3}{4}$ in., and should be so specified on the drawings.

When the wristpin holes become enlarged, the crossheads can be reclaimed by re-reaming them and welding steel blocks in place, as shown in the illustration. The welding is done by the acetylene process, and the blocks are then bored and reamed to standard size. The crossheads should be preheated before the welding is done, after which they should be annealed. Quite a saving can be made by reclaiming crossheads in the manner described, the amount, of course, being dependent upon their size and design.



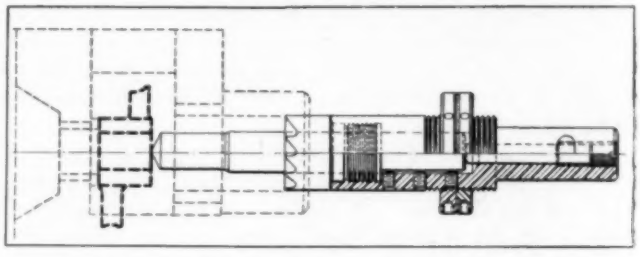

Method of reclaiming crossheads having oversize wristpin holes

## Tool for Drilling, Reaming and Spot Facing

By H. L. Wheeler

A job that was formerly done with three separate tools is now done by the use of the single, combination tool shown in the illustration. A suitable jig bushing, having a fixed relation between its top and the face of the work, is used as a stop for the spot-facing tool. The tool itself consists of a drill, a reamer, and a spot-facing tool. The drill and reamer are in one piece and are inserted in a shank where they are held by three setscrews butting on flats on the shank of the combined reamer and drill. The spot facer is a separate piece and is screwed into a threaded hole in the body of the toolholder. The toolholder is provided with a shank that fits a quick-change chuck.

Threaded collars on the upper part of the toolholder provide means of adjustment for the tools as they are ground back. The body of the spot facer is a running fit in the jig bushing that guides all three tools. The spot facer enters the bushing about $\frac{3}{4}$ in. before the drill begins to cut.



Combination drill, reamer, and spot-facing tool

## Preventing Soap Streaks in Paint

By Joe Kelly

In air testing pipe joints, welded tank seams, and similar parts, soap suds are commonly used to indicate leaks. Very often the tested member must later be painted.

Most kinds of commercial soaps, if not thoroughly removed from the surfaces after the test, will produce white streaks in the paint. This is naturally objectionable as it mars the appearance of the finished product.

This difficulty may be avoided by the use of soap bark, the inner bark of a large tree of the rose family which grows in Chile and Peru. When immersed in water, the bark produces a foamy lather which is very tenacious and will not streak paint. These properties make the use of soap bark advantageous on work to be painted after air testing.

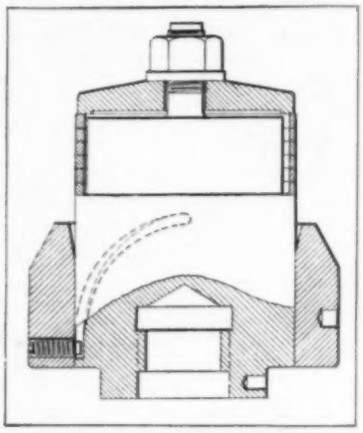
## Chuck for Turning Valve Rings
### *Discussion*

By James G. Turton
*Heald Machine Company*

Commenting on the article by H. P. Leonard, under the title given above, on page 229, Vol. 72, of the *American Machinist*, the loading and unloading time of the chuck described by him would be prohibitive where rings were to be turned in great quantity.

In the accompanying illustration, is shown a chuck designed for ease of loading and unloading in rapid production. While this chuck was used for grinding the outside diameter of piston rings, it would be equally useful for a turning operation.

Referring to the illustration, the larger diameter of the body is equal to the finished outside diameter of the rings to be ground, plus the grinding allowance. The diameter of the nose, on which the rings are loaded, is $\frac{1}{8}$ in. less than that of the inside diameter of the rings. The collar is mounted on the chuck body so that it can be both moved endwise and rotated. Its mouth is flared so that the diameter at the front is $\frac{1}{8}$ in. larger than the expanded diameter of the rings. A screw through the collar engages a radial slot in the body of the chuck, causing the collar to slide forward when it is rotated. The clamp plate at the front is in the form of a large C-washer to permit easy removal when loading or unloading, and without removing the nut.



A chuck for grinding piston rings

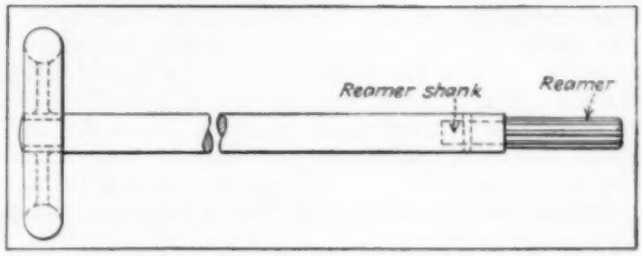
In operation, with the clamp plate removed, the rings are slipped over the nose of the chuck. The clamp plate is replaced and the rings are lightly clamped. The collar is rotated, sliding forward and engaging the rings, compressing them as it advances. After all the rings have been compressed, the clamp plate is brought up tightly against them, after which the collar is returned to its former position. The rings are then ready for grinding.

## Reaming in the Lathe

By Charles R. Whitehouse
*Chief Time-Study, The Holtzer-Cabot Electric Company*

As is often the case, a limited quantity of pieces are to be drilled, bored, and reamed at the same chucking, and it does not seem worth while to set up the tools in a turret lathe. In such cases, the drill can be set in the tailstock spindle and the boring tool or bar, in the toolpost of an engine lathe. A short-shanked reamer, mounted on an extension bar having a handwheel at one end, as shown in the illustration, can be inserted through the hole in the live spindle from the rear.

The reamer and its bar ride idly in the spindle while the drilling and boring are being done. When it comes to reaming, it is necessary only for the operator to reverse the lathe, grasp the handwheel, and push the reamer through the hole in the work. Of course, the hole to be reamed must be smaller in diameter than the hole in the lathe spindle. We have been using this method for several years and it has always given satisfaction.

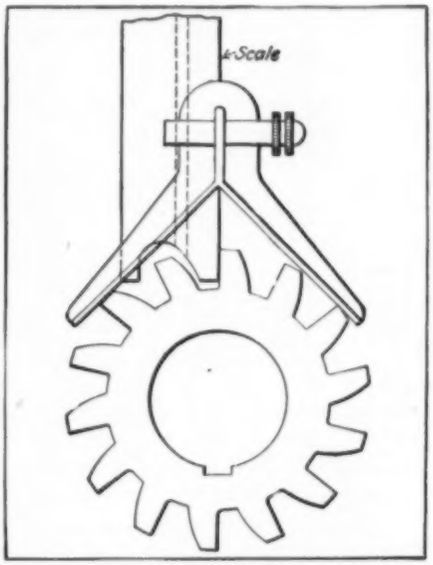



Reamer and bar to be used through the hole in the live spindle

## Device for Testing the Grinding of Hobs

By E. E. Keeler

In the shop where I am employed, the foreman of the gear-cutting department and the foreman of the toolroom were continually arguing as to whether or not the faces of the teeth in the gear hobs had been ground truly radial. To settle the arguments, I rigged up the device shown in the illustration. Basically, the device consists of the scale and the center head of an ordinary combination square. The only alteration was in grinding the end of the scale, as shown, to clear the backs of the teeth in the hob, leaving an edge thin enough to go down the narrow flute and reach to the bottoms of the tooth faces after they have been ground.




Gage for testing the grinding of hobs

In use, the thin edge of the scale is brought into contact with the ground faces of any of the teeth, showing at a glance whether or not the grinding has been properly done, thus preventing further argument in the matter.

## A Gooseneck Tool for the Shaper
### *Discussion*

By R. B. Ware

The toolholder described by H. L. Wheeler, in an article under the title given above, on page 66, Vol. 72, of the *American Machinist*, attracted my attention.

With the clamping screw in the position shown, the

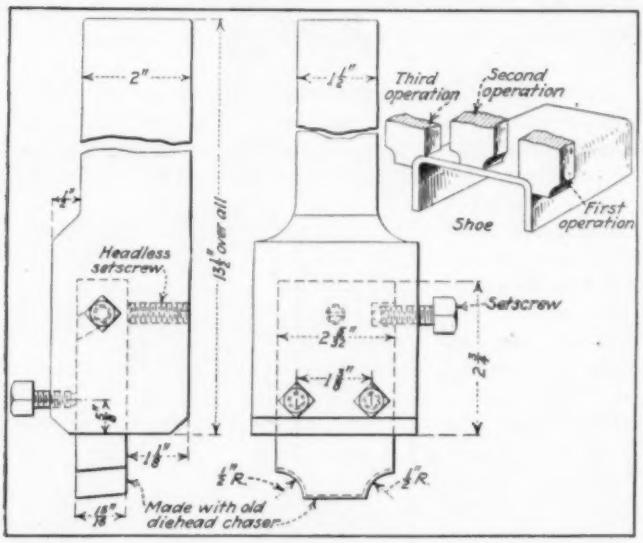
pressure of the cut comes on the screw at a bad leverage. To make matters worse, the point of the screw is rounded, so that heavy cuts will soon make the toolbit look as though it had been through a Brinell hardness tester. Several methods of clamping the toolbit could be used, but if clamped by a screw, the screw should be against the front so as to push the toolbit in the same direction as that of the cut. Also, the screw should have a flat point.

## Radius Tool

By Louis P. Simoneau

An improved radius tool is used on the shoe and wedge job at the Boston and Maine Railroad repair shops, Belleria, Mass. The tool formerly used on this job was forged from high-speed steel, weighing eighteen pounds, and costing about twenty dollars.

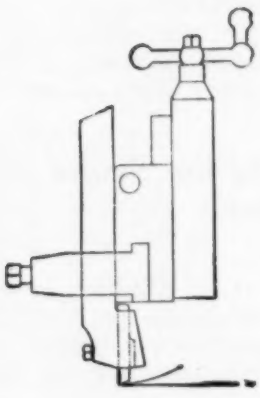
The radius tool illustrated was forged from a piece of




**Putting old die-chasers to a good use**

low-carbon steel and machined to fit an old chaser ground to the radius desired. These chasers were discarded from a 4½-in. Geometric Style D diehead. The idea is a great economy as the new design tool costs much less.

## A Gooseneck Toolholder for the Shaper—*Discussion*



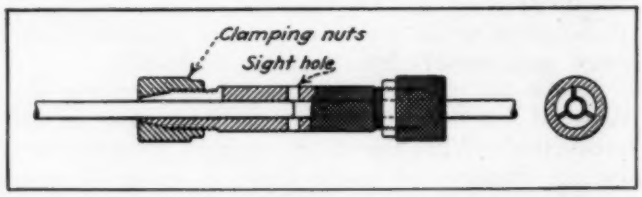
By Thomas Fish
*President, Ready Tool Company*

On page 66 in Vol. 72 of the *American Machinist*, H. L. Wheeler attributes the loss of popularity of the gooseneck shaper tool to the lack of suitable toolholders. Our Red E style K tool shown in the illustration, which embodies this principle has been manufactured for some time.

## Clamp for Micrometer Extension Rods

By F. S. Doughty
*Leeds, England*

The clamp shown in the illustration is very useful for holding extension rods in inside micrometers to increase the measuring range. For measuring internal diameters beyond the range of the rods furnished with the instru-




**Clamp for rods of inside micrometers**

ment, two of the longest rods can be held in the clamp, making virtually one long rod.

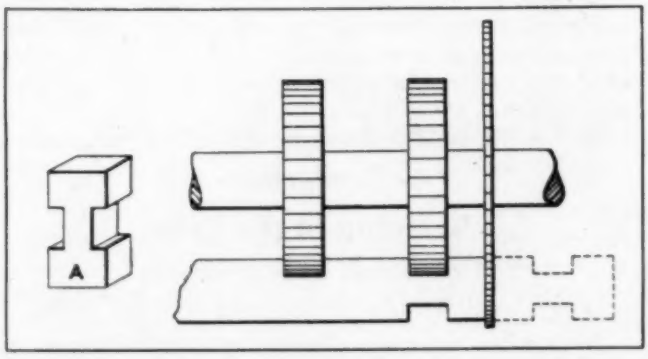
The body of the clamp is made from a length of mild steel bored to receive the rods. The ends are threaded, tapered, and split to form clamps in connection with the two nuts. A sight hole is drilled crosswise in the center of the body so the user may see that the inner ends of the rods meet before finally clamping them. The clamp body and the nuts are knurled to facilitate handling.

## A Milling Machine Set-Up

By R. H. Kasper
*Master Mechanic, Steel Heddle Manufacturing Company*

In milling a quantity of pieces, such as the one shown in the illustration at *A*, a method was followed that I believe to be unique. The cutters and the saw were placed on the arbor, as shown, the space between the cutters being equal to twice the length of the larger part of the work, plus the thickness of the saw, which was placed the proper distance from the outer cutter.

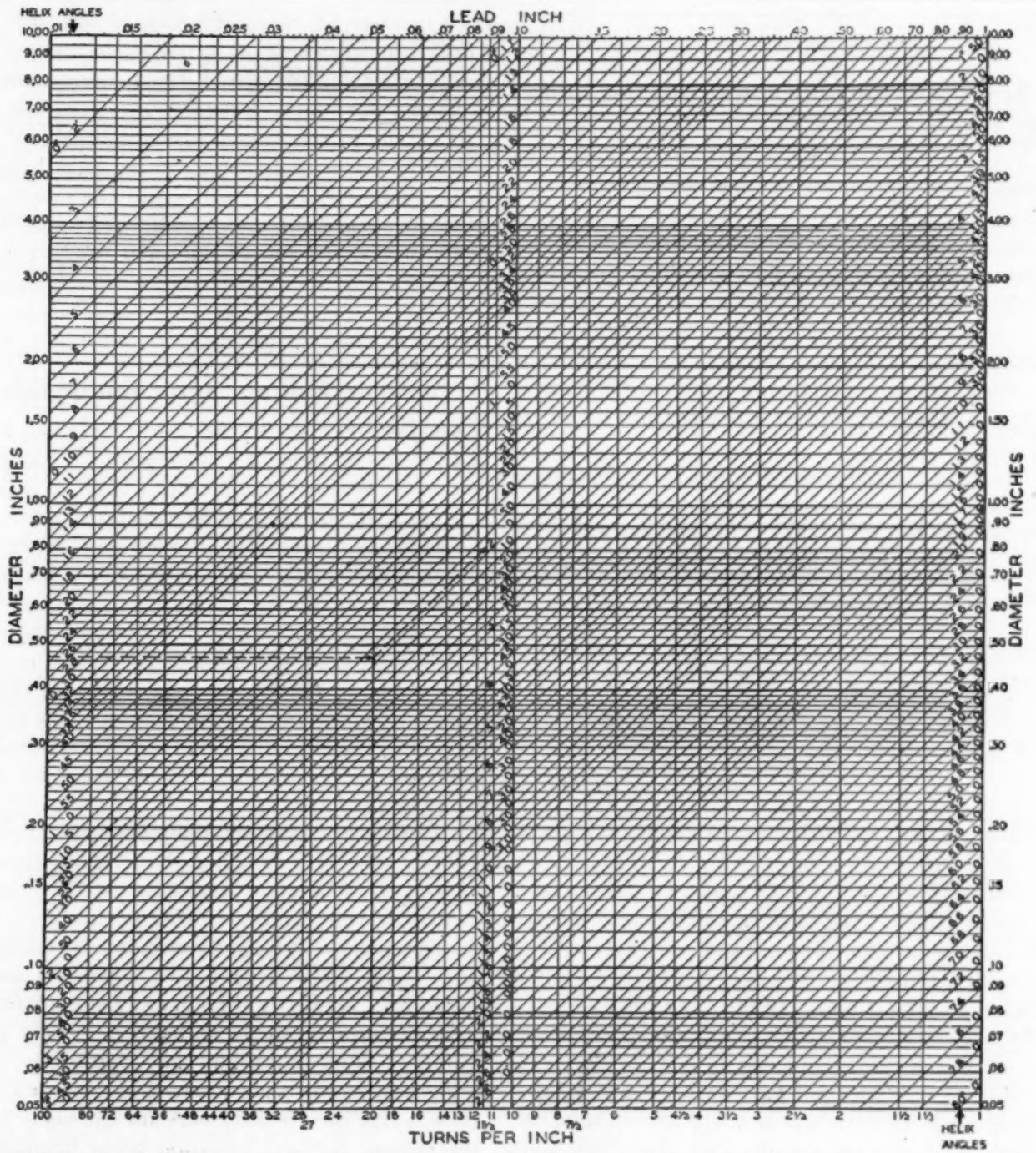
After each cut, the stock was turned half a revolution and was then fed forward for the next cut. It will be




**A time saving set-up**

noted that the groove cut by the inner cutter before the stock was turned over, is directly under that made by the outer cutter in the second operation. After a piece had been cut from the end of the stock to square it, a finished piece was cut off at each pass of the work under the cutters, and one turnover of the stock. The resulting saving in time is, of course, obvious.

# Screw-Thread Helix-Angle, Diameter, and Lead Determinations




GRAPHICAL relationships among diameters, leads, and helix angles of screw threads at major, minor, or pitch diameters of standard pitches of any American National thread between diameters from 0.05 to 10 in., and 1 to 100 threads per in., are charted. Diameters are on vertical scales, leads on horizontal, and helix angles on the diagonals; vertical lines are drawn to correspond with threads per in. of the standard systems and are designated at the bottom. Non-standard pitch abscissae may be determined by interpolation on the lead scale and transferred to the diameter ordinate with dividers.

Example—To determine the pitchline helix angle of a ½-in., 20-thd., 60-deg., thread. Basic diameter is 0.4675 in. Reading at the intersection of 0.468 on the diameter scale and 20 turns on the vertical scale, the diagonal line immediately below is 2 deg., and interpolation gives the helix angle as 1 deg. 57 min.

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*Editors:* KENNETH H. CONDIT AND FRED H. COLVIN

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## *Spend the Machine and Spare the Man*

MOTION study experts have been complaining for some years that the designer of production machinery is not giving sufficient thought to the comfort and efficiency of the man who is to operate the machine. No criticism of the application of mechanical principles or of the fundamentals of strength of materials is offered. Evidently the machinery builder knows that end of his job.

How seriously should this criticism be taken? Is it just the complaint of a few enthusiasts, or is it something deeper?

Perhaps the statement that one large manufacturing organization has eighty trained motion study men at work in its various plants will give the answer. These men are certainly going to have a voice in the selection of equipment to be bought by this company. And they are going to insist that it is better to spend the machine and spare the man.

*

## *Scrapping the Trade-Ins*

TRADE-INS have long been the bane of the machine tool dealer's existence. But their acceptance has been in accord with custom. The purchaser of a twenty-thousand-dollar planer expects an allowance on the prehistoric relic he wants to be rid of; the purchaser of a seventy-five dollar vacuum cleaner or a two-hundred-dollar radio has been educated to the same point of view. As for the automobile dealer, he has always been in trouble with his trade-ins.

In the machine tool field various efforts have been made to curb the trade-in abuse, some of them markedly successful. But there has been little talk of any such drastic policy as the printers are proposing. The printers have seen shoestring competitors pick up their discarded presses, run them fourteen hours a day in an attic, and demoralize prices in the printing market. They propose, therefore, that to keep old printing presses from coming back to haunt them, they break up the old presses instead of trading them in.

Apparently this policy originated with the users of printing machinery, and not with the dealers. Whether it can be made an accepted practice depends partly on personalities in the printing business, partly on how much of value and usefulness remains in the old press, and partly on whether obsolescence or physical decrepitude is the governing factor when a replacement is made.

At the very least, however, the move on the part of the printers should give the makers and sellers of other kinds of machinery something to think about. If they could instill the same doctrine into the minds of machine tool users how much simpler the life of the seller would be!

*

## *Need of Railway Shop Equipment*

RAILROAD shops the world over seem to have one common characteristic, the lack of adequate machine equipment. And in nearly every case the official in charge has the same complaint—that he has requisitioned new machinery but that the powers that control the check book refuse to make the necessary appropriation. Nor is this refusal always caused by a lack of appreciation of the need of new machinery nor to contrariness on the part of the man who signs checks. In too many cases lack of funds, which may be due to any number of causes, or fear of a lessened income during the months to come, make it a duty to defer purchases.

In Japan, for example, there is a general policy of retrenchment. In China the frequent clashing of armies of different provinces, or of different factions in the same province, not only prevent the purchase of new machine equipment but make it very difficult to keep rolling stock in a usable condition. While the Philippines have neither of these difficulties and the railroad is in very good condition both physically and financially, new equipment is not being ordered at present. The same is true of new machinery for the sugar mills, the present political agitation being blamed for the caution that is displayed.

Whatever the cause for delay, the need for new equipment should not be forgotten, since it has a direct bearing on the cost of present and future operation of the railways.

# SHOP EQUIPMENT NEWS

## Bullard-Dunn Electro Chemical Cleaning Process

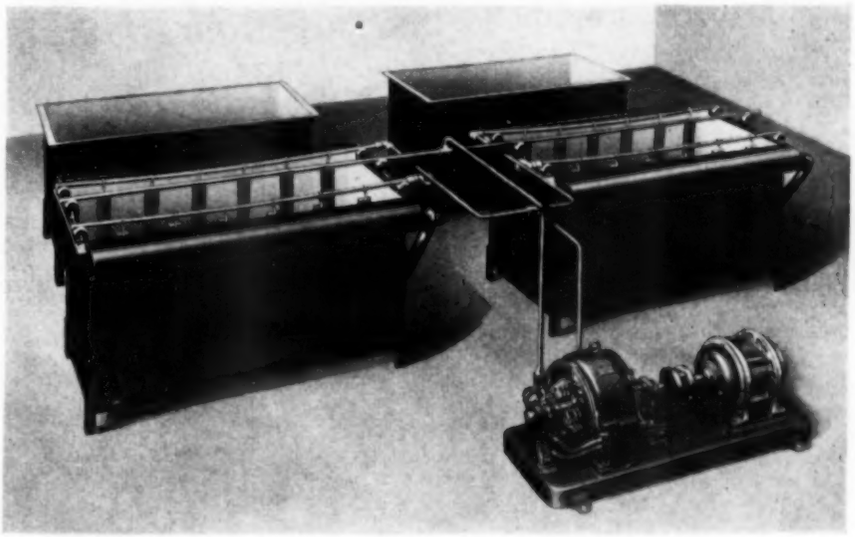
TWO DISTINCT applications of the Bullard-Dunn electrochemical cleaning process are open to metal working establishments. The first is the complete removal of scale and oxides from the surfaces and recesses of metallic products in order to effect economies in the subsequent steps of manufacture where scale and oxide might reduce tool life and mar the work, and to show up any cause for rejection immediately. The second field of application is the cleaning of metal products before plating.

At present it is the purpose of the Bullard Company, Bridgeport, Conn., originators of the process, to extend its use on the basis of a license charge and royalty fee. This cleaning method has been used in the Bullard plant for several years and was originally developed for the removal of scale and oxide from hardened spring-steel bumpers, which were to be polished and plated. It was later applied to the cleaning of all forgings and heat-treated alloy steel parts entering into the construction of the Bullard vertical turret lathes and Mult-Au-Matics, in which large savings have been effected and improvement in quality made as well.

In the Bullard-Dunn process the metal surface is cleaned by the action of hydrogen electrically generated at the cathode in an aqueous solution, and, as it is cleaned of scale and foreign matter, it is simultaneously protected from pitting, etching, and hydrogen embrittlement by the deposition of a homogeneous metal coating. The outstanding feature of the process is its ability to search out and thoroughly clean recesses, tapped holes, and surfaces ordinarily inaccessible to a cleaning agent. The original metal is not affected regardless of the time of immersion in the solution. It should also be noted that original defects in material, such as pipes in barstock or seams and ruptures in forgings, and also hardening cracks become outstandingly prominent, and are easily and surely detected so that early rejection is made certain.

In subsequent manufacturing operations, the thoroughly de-scaled and clean products coming from this process are conducive to reduced tool cost and quick assembly, and because of this production is speeded up. Forgings cleaned with the process are more easily machined and with lower tool cost because of the complete removal of scale. The rejection of defective forgings before the machining operations is also an advantage to the user. Marked economies can also be affected in the toolroom, since intricate dies may be readily and quickly de-scaled after hardening and drawing, and while being cleaned, may be thoroughly inspected for hardening cracks, since these are thrown into prominent relief by the process. Complete removal of hardening scale without destruction of the contour or dimension assures a more perfect product, unmarred as to surface and truer to designed form and dimension. In deep-drawing operations the scale formed in each anneal is detrimental to dies and punches as well as to the finished product, which may be deeply scored by the cutting action of even the smallest particle of scale. The protective metal coating formed in the first step of the process has been demonstrated to have a considerable value as a lubricant in this class of work.

Oxides as well as scale are also removed during the process, and in consequence a longer life of tools used in the fabrication of stainless steel or rustless iron may be expected. After each annealing operation on such materials, chromic oxides are generated and when mixed with lubricating oil are especially abrasive. The production capacity of the polishing department is also increased since the effective life of a polishing wheel is materially lengthened by the preliminary elimination of chromic oxide from the surface to be polished. The cost of wheel renewal is also reduced. Furthermore, by the prevention of minute chromic-



**Equipment required for the Bullard-Dunn Electro-Chemical Cleaning Process includes a source of low-voltage direct current, a tank or tanks with steam, water and electrical connections, and a ventilating system. The metal surface is cleaned by the action of hydrogen generated electrically at the cathode**

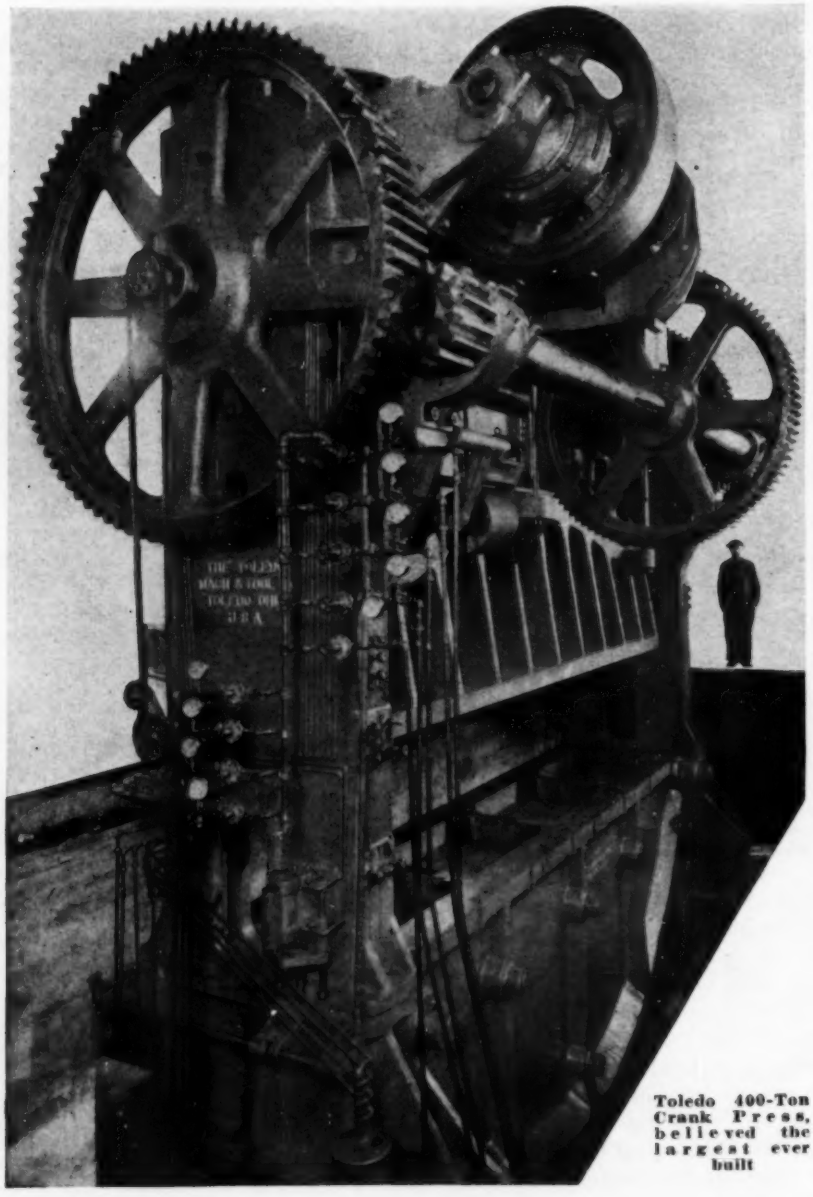
oxide particles in the finish-polished surface, the product is less susceptible to atmospheric corrosion, since there are no foci around which general surface corrosion can emanate.

As a preliminary to electroplating operations, the process has been proved of value. Several different solutions have been developed for the effective cleaning and de-scaling of ferrous and non-ferrous metals. The quality of electroplating is improved because there is deposited on the clean surface, including all recesses and depressions, a homogeneous metal coating which forms an ideal surface for subsequent electroplating with metals such as nickel, copper, chromium, cadmium, etc. By the practical elimination of rejections usually resulting from the plating of uncleaned and electrically inactive surfaces, the cost per piece has been reduced. As shown by salt spray tests devised by the U. S. Bureau of Standards, the plated surface is practically indestructible.

The equipment required consists of a source of low voltage direct current, a tank or a series of tanks properly equipped with steam, water, and electrical connections, and a ventilating system for the removal of gases and fumes developed in the process. These gases are not noxious nor detrimental to health, but good ventilation is advised.

## Toledo 400-Ton Crank Press

A PRESSURE at the bottom of the stroke of 3,500,000 lb. is obtained on the 400-ton crank press announced by the Toledo Machine & Tool Company, Toledo, Ohio. The column of this press weighs about 130,000 lb., the slide about 130,000 lb. and the bed 300,000 lb. complete. The total weight of the press is approximately 800,000 lb. The two steel gears on the crankshaft are 140 in. in diameter with an 18-in. face. A bed area of 288 in. from right to left and 68 in. from front to back is provided. The total height of the press from the floor to the top of the arch is 36 feet.



Toledo 400-Ton Crank Press, believed the largest ever built

Notwithstanding the great weight of the moving parts, the slide has been counterbalanced by four air cylinders, two of which are at the front and two at the back of the press. These counterbalances insure smooth running of the slide which operates at seven strokes per minute. The press is controlled by a patented multiple disk friction clutch with independent brake, which enables the operator to stop and start the press at any point on the stroke. Timken roller bearings are used in the flywheel. An air-operated control valve operates the clutch mechanism easily. The hand lever is used for emergency and for setting dies with the control handle in neutral position.

A 150-hp. motor mounted on the rear of the right hand upright and belted to the flywheel furnishes the power. This motor may be stopped or started easily. The motor mounted on the front of the press is used for adjusting the slide. The press illustrated is to be used for heavy blanking, forming and piercing operations in the manufacture of extra large truck rails, and other parts.

## Hammond Motor Air Cleaner

A motor air cleaner is now standard equipment on all grinders and polishers of 3 hp. and larger, supplied by the Hammond Machinery Build-

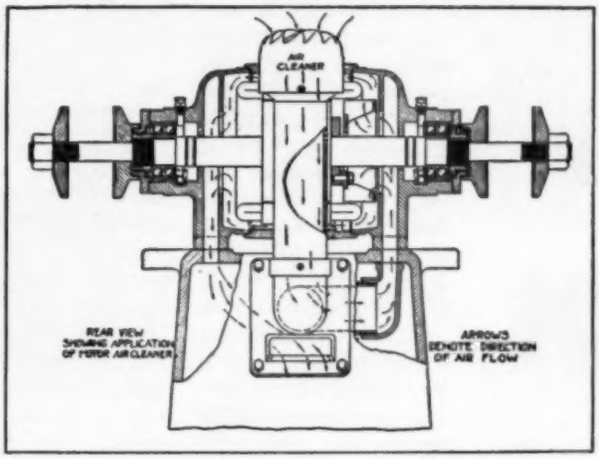



**Diagram of a Hammond Grinder, showing how the motor air cleaner is applied**

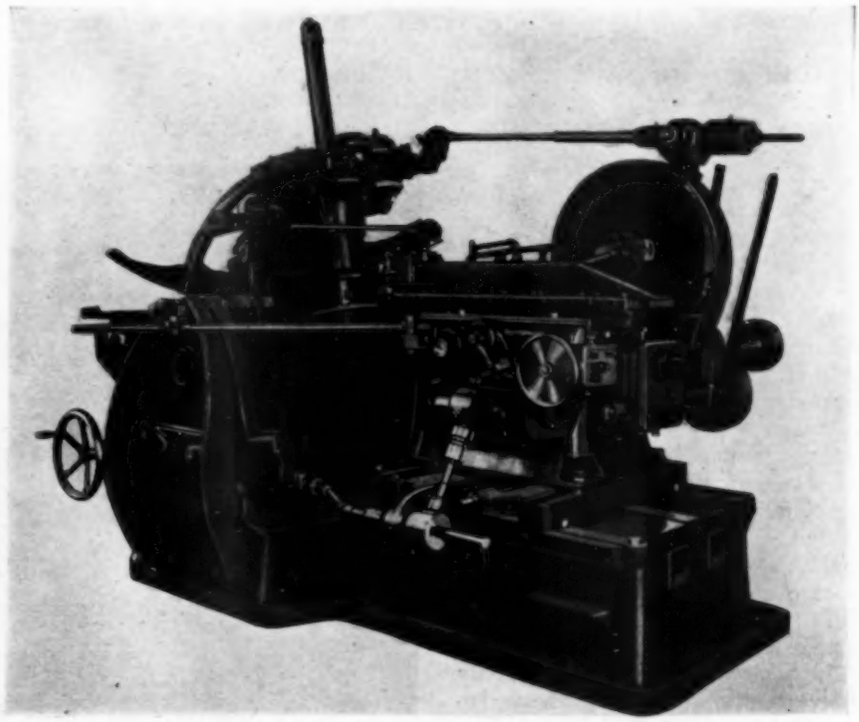
ers, Inc., Kalamazoo, Mich. This air cleaner is of the centrifugal type and is direct connected through a pedestal to the cored end bell of the motor. The motor is totally inclosed, and the specially designed fan on the spindle forces clean, cool air over the motor windings and through the opposite end bell to the pedestal, where it is discharged through an outlet. This insures operation at less than 40 deg. C. and consequently the efficiency of the motor is somewhat higher than usual. Emery, metallic dust, and chips cannot get in to damage the motor windings.

## Reinecker Bevel Gear Generators

BOTH straight and spiral gear can be cut on the line of six Reinecker precision bevel gear generators introduced into the United States by the George Scherr Company, 142 Liberty St., New York, N. Y. Six different sizes are available to cut from $\frac{7}{16}$ to 43-in. diameter gears. All sizes, except the first, have single pulley drive, and all feed and speed changes are obtained by gear boxes operated from one position. The second, third and fourth sizes have an adjustment in the ram saddle, thereby increasing their range, especially on pinions integral with long shafts.

These machines work on the self-generating principle and index the gear blanks from tooth to tooth after each stroke. A plane crown gear of 180-deg. pitch angle is assumed, the tooth outlines of which are rectilinear flanks running to the apex. The cutting tool represents the tooth of such a plane gear and the gear to be planed or cut unrolls automatically on the assumed crown gear. Tools employed consist of a set of triangular planing tools cutting on their flat sides and generating the involute curve from an exact central position. The standard pressure angle is 15 deg., but if other pressure angles are desired they can be produced by means of a special tool-holder. A set of three tools can be employed to produce a great number of pitches and therefore the tool cost is low. Because of the fact that the gear blank is indexed from tooth to tooth after every stroke, the heat generated is evenly distributed over the entire circumference and the wear of the tool is easily distributed over all the teeth in the gear.

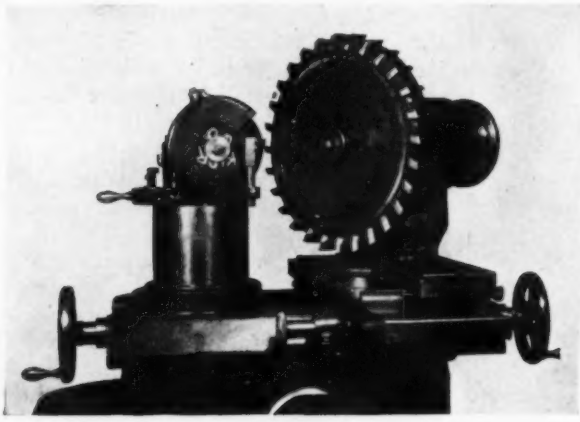
The No. 0 size is made for straight teeth only and has a cone pulley drive. The other five sizes are arranged for single pulley drive, but individual motor drive can be furnished. The diametral pitch capacity varies slightly as the size of the machine increases, but for roughing and finishing this capacity is 8 DP for the No. 0 size and $1\frac{1}{4}$ DP for the No. 4 size, the largest of the six machines. The horsepower required ranges from 1 to 5, and the approximate weights range from 1,650 to 24,650 pounds.



**One of the largest of the six Reinecker Bevel Gear Generators, which employ the "self-generating" principle. Both straight and spiral teeth can be cut on this machine. The largest diameter of gear taken is 43 inches**

## Face Mill Grinding Attachment for Cincinnati No. 2 Cutter Grinder

For sharpening face mills from 8 to 18 in. in diameter, a face mill grinding attachment has been developed for use with its No. 2 plain or universal cutter grinders by the Cincinnati Milling Machine Company, Cincinnati, Ohio. The attachment consists of three units; the



**Sharpening the corners of the teeth on an 18-in. face mill, using a face mill grinding attachment on a No. 2 Cincinnati Cutter Grinder**

spindle assembly, the swivel base, and the special arbor. The entire assembly is rigidly constructed.

The work spindle has a No. 7 Morse taper hole and is mounted upon anti-friciton bearings both front and rear, giving the sensitive and free movement desirable when indexing from one tooth to another. The knurled handwheel on one end of the spindle is useful in swinging the mill to the grinding position. A graduated swivel base permits the operator to swing the work through 360 degrees. Provision has been made for locking the spindle after the cutter blade is set in line with the center line of the grinding wheel spindle, so that movement of the cutters is prevented while setting up the tooth rest. The distance between center line of the attachment and the table is 9½ inches.

Equipment furnished with this attachment consists of a No. 7 Morse taper arbor for holding face mills that fit spindles having the National Standard spindle end, a special pulley for the driving motor, a straight 8x⅜x1¼ grinding wheel, and a wheel guard. The net weight is 135 pounds.

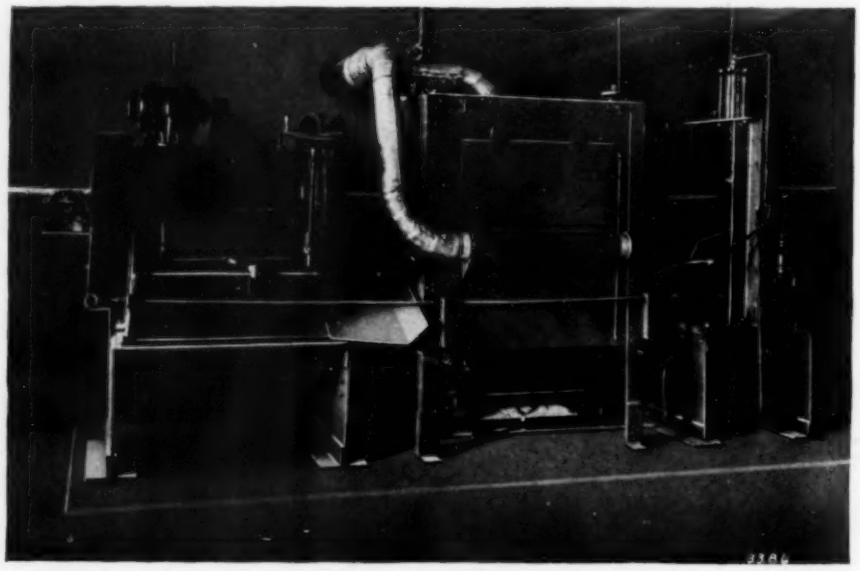
## Ryerson "New Haven" Sand-Blast Flue Cleaning System

SCALE can be removed from the surface and also in pitted holes in locomotive boiler flues by means of a "New Haven" sand-blast flue cleaning system developed by Joseph T. Ryerson & Son, Inc., 16th & Rockwell Sts., Chicago, Ill. Heavily pitted flues may be easily detected and rejected.

This cleaner consists of five units, which are as follows: the scale cracking unit, the sand-blast cabinet, the flue puller, the dust arrester, and the exhauster. Any standard or superheater size flue is handled, the capacity ranging from 1½ to 6-in. outside diameters. Only one flue is put through the cleaning system at a time. Two inch flues are cleaned at the rate of one per minute, whereas 6-in. superheater flues are sand blasted at the rate of 20 per hour.

The scale cracking unit is heavily constructed and the rolls have replaceable rims of a special hard steel. These rims have teeth that bear against the outside of the flue and crack the scale. They do not mark or damage the flue in any way and are mounted at an angle so that, as they remove the scale, they also feed the flues into the sand-blast cabinet. A set of guides is furnished to handle the complete range of flues from 1½ to 6 inches.

As the flue leaves the cracking unit, it enters the sand-blast cabinet automatically and is subjected to sand discharged at high velocity from a battery of nozzles. It is continually revolved and thus every particle of scale is scoured from the surface. The sand drops to the bottom of the cabinet, where it is sucked up through rubber tubes to be used over. All dust is drawn off through the dust manifold and exhaust tube. It is then removed by means of a trap door at the bottom of the cabinet. After the flue has been sand blasted, it is brought out by the flue puller.

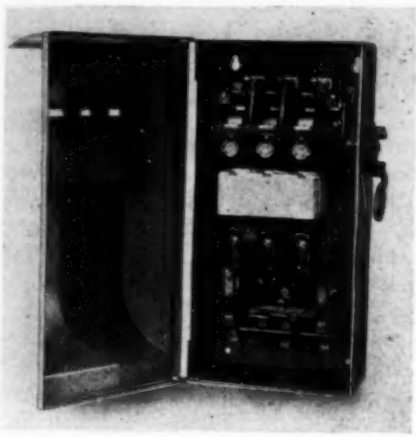


**Ryerson "New Haven" Sand-Blast Flue Cleaning System, which cracks the scale, sandblasts the tube, and catches the dust. It reconditions from 1½ to 6-in. flues in preparation for welding the safe ends**

## Westinghouse Combination Linestarter and Safety Switch

A combination linestarter and safety switch designated as Class 11-200-HD, has been developed and placed on the market by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. This apparatus occupies a minimum amount of space, being much more compact than a linestarter and safety switch mounted in separate cabinets.

A feature is the provision for inserting a plug-type meter test jack



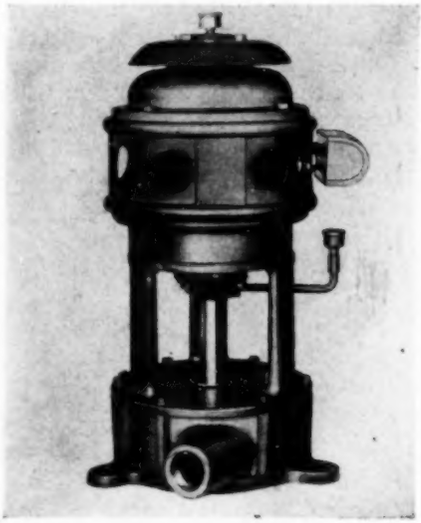
**Westinghouse Combination Linestarter and Safety Switch**

to determine the load on the machine while the motor is in operation, and while the door of the cabinet is closed. The equipment can be used with or without fuses, jumpers being supplied for use when fuses are not employed. The safety switch has quick-break contacts, and the handle is interlocked with the cover, thus preventing opening of the door when the contacts are closed.

## Ruthman Model A-L Vertical Coolant Pump

Designed for supplying coolant to a number of machines from a central reservoir, the Model A-L two-stage coolant pump has been added to the line manufactured by the Ruthman Machinery Company, Cincinnati, Ohio. This pump is capable of developing a pressure of 39 lb. per sq.in., and is equipped with a ½-hp. motor running at 1,725 r.p.m. It has no packing, and thereby eliminates unnecessary friction. This permits full benefit of the ball bearing construction.

The intake is constructed with a stationary device of three curved blades to prevent the water from whirling. This feature prevents the entrance of air, making the flow uniform and free from air bubbles.



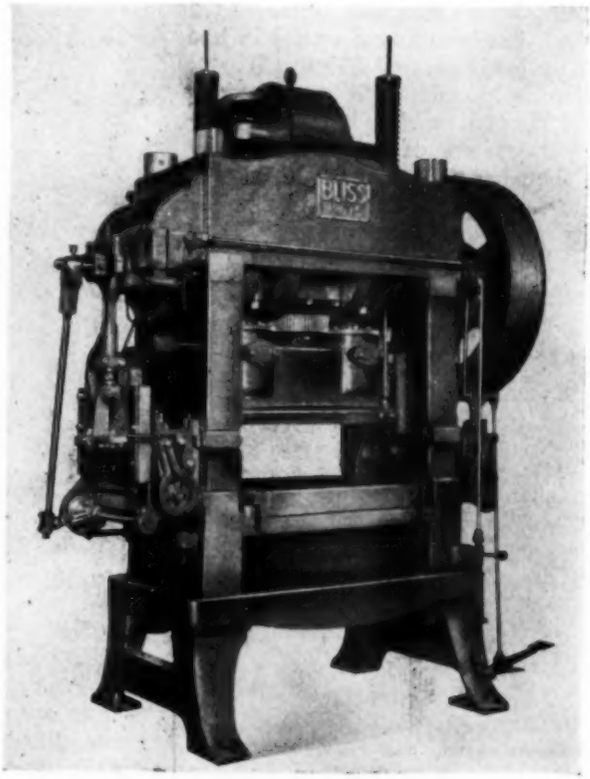
**Ruthman Model A-L, Two-Stage Vertical Motor-Driven Coolant Pump, which is suitable for supplying coolant to a number of machines from a reservoir**

## Bliss No. 675 Double-Eccentric, High Production Press

THE need for the automobile, radio, and electrical industries for an even heavier automatic press that will maintain dead true accuracy on progressive die work, while operating at 150 to 250 strokes per min., has led to the addition of a 125-ton, double-eccentric, high-production press to the line manufactured by the E. W. Bliss Company, 53d St. and 2nd Ave., Brooklyn, N. Y. This machine is designed with ample room for long follow dies. It has a bolster area of 27 in. from front to back by 35 in. from right to left, and will handle dies up to 8 in. shut height. Standard stroke and die space dimensions can be readily changed to meet unusual conditions.

To maintain rigidity at high operating speeds, the double-eccentric shafts are supported close up to the one-piece ball joint connections so that bending stresses in the shafts are eliminated. Rigid support is given to the double-eccentric shaft and the slide by the long main center bearing and deep-ribbed crown, even though the center of pressure of the progressive dies may be considerably off the center line of the slide.

It is claimed that the high-speed, double-roller grip feed on this machine is very accurate. When furnished for feeding strip stock, it is equipped with a mechanical starting gage operated by a treadle, so that the operator's hands are free to guide the strip. With this device the rolls are fed automatically for a full stroke into the dies at the beginning of strips, thus eliminating a source of cutting half blanks, burring of stock, and punch breakage. This mechanism also makes it possible to have uninterrupted feeding of strips for practically continuous production. Other features are the shear-type




**Laminations, auto hardware, and other work can be made with progressive dies in this Bliss No. 675 High-Speed, 125-Ton, Double-Eccentric Press, which operates at 150 to 250 strokes per min. Large die space is a desirable feature**

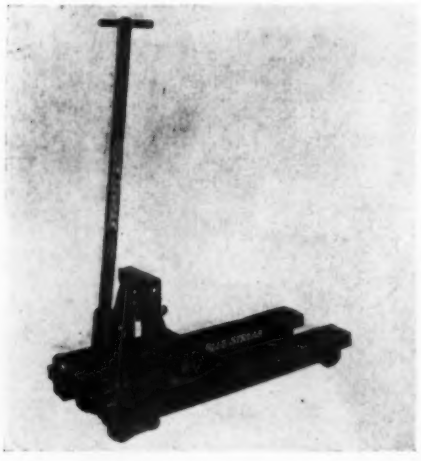
scrap cutter, rolling key clutch, flexible motor drive, and easy adjustments.

Among the important specifications not mentioned above are the following: Area of face of slide, 15x30 in.; adjustment of slide, 1½ in.; standard strokes, 1 in. and 1½ in.; length of feed rolls, 15 in.; distance floor to top of bed, 32 in.; over-all height without motor, 108 in.; floor space over-all, 62 in. front to back by 88 in. right to left, and approximate weight with feeds, 15,000 pounds.

## Stuebing "Blue Streak" Tin-Plate Lift Truck

A lift truck for handling tin plate loaded on skids or stringers has been developed by the Stuebing Division of the Yale & Towne Manufacturing Company, Cincinnati, Ohio. This truck has been found useful in handling loads up to 2,500 lb. The tin plate is loaded on three stringers of 3¾x3¾x24 in. and is held in place by several pieces of metal strapping.

The truck is so constructed that the two parallel frames in the rear



Stuebing "Blue Streak" Tin-Plate Lift Truck, which has capacity of 2,500 pounds

can be pushed easily beneath the three stringers, and then by a single forward motion of the steering handle, the load is elevated 1⅝ in. A capacity load can be moved without overexertion of the operator, since all of the wheels are equipped with ball bearings. Such a truck is of especial value to concerns that do not receive or ship enough tin plate to warrant an electric tier lift truck.

## Langelier Semi-Automatic Upright Drilling Machine

TEN drilled and reamed brass ball float levers are produced per minute on the semi-automatic upright drilling machine announced by the Langelier Manufacturing Company, Providence, R. I. Two ⅛-in. holes spaced ⅜-in. apart are drilled and reamed semi-automatically in two types of die forged levers.

The machine consists of a standard No. 21 automatic drilling unit mounted on an upright column bolted

Langelier Semi-Automatic Upright Drilling Machine

to the planed surface of the horizontal table. The automatic drilling unit is equipped with a drilling and reaming head of eight spindles, four spindles for each type of lever. It is used in conjunction with a seven-station, automatically operated, circular indexing dial also bolted to the table. A dial, operated by a face cam on the automatic drilling unit, is connected through levers and a connecting rod to a pawl and ratchet wheel on the indexing fixture. A positive lock is also provided for accurately locating and holding the dial in position.

The indexing fixture has two separate interchangeable dial plates, one for each type of ball float lever. Each dial plate is fitted with sever. hand clamping levers, V-blocks, and stop blocks for locating and holding the float levers. A stationary drill guide plate is used for starting the drills accurately.

The automatic drilling unit is belt driven by a 1½-hp. motor attached to the rear of the column. The machine can be run continuously or to start and stop at each drilling cycle. A feed cam on the automatic drilling unit gives the drills fast advance, drilling feed, and fast return.

Floor space occupied, 28x44 in., and weight, approximately, 1,800 pounds.

## Condit Type A-15 Air Motor Starter

Arc prevention is the chief feature of the Type A-15 air motor starter announced by the Condit Electrical Manufacturing Corporation, Boston, Mass. The contacts, according to the manufacturer, are of such shape, mass, relation, and arrangement with respect to the voltage and the energy to be absorbed as to reduce the visual evidence of circuit interruption to a spark of negligible importance, even under heavy overloads. The starter contacts are assembled in units on insulated carrier bases, one stationary and the other movable. The movable contact base can be withdrawn without the use of tools, permitting ready inspection of both movable and stationary contacts. Both the stationary

Condit Type A-15 Air Motor Starter

repairs in very isolated locations.

The starter is simple and compact, and is inclosed in a steel case arranged with conduit knockouts. Thermal cutouts are provided for time-lag overload protection. The Type A-15 air motor starter is furnished for 7½ hp. at 550 and 440 volts, 5 hp. at 220 volts, and 3 hp. at 110 volts.

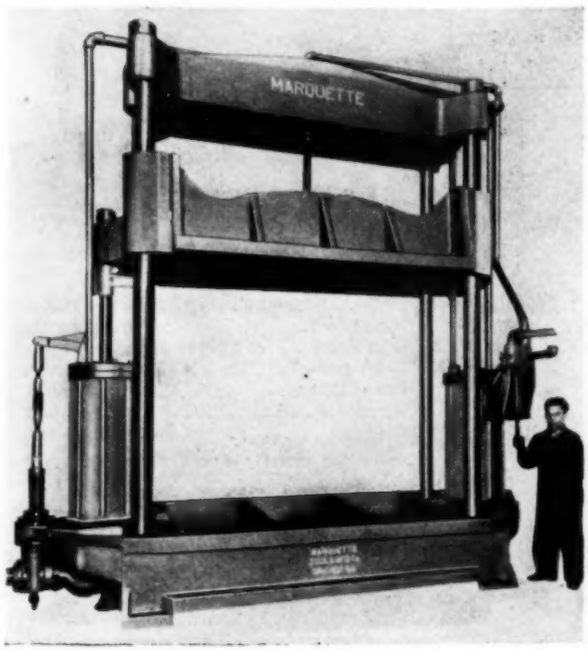
## Marquette Die Spotting Machine

APPROXIMATELY 90 per cent perfect spotting of dies and the cutting of die making time can be effected on a die spotting machine now available from the Marquette Tool & Mfg. Company, 1906 North Kilbourn Ave., Chicago, Ill. This machine is available from bench sizes to 100-ton models. It is claimed that by its use only a small amount of the dressing and fitting ordinarily done is required to put dies in shape for operation.

When the die is to be spotted, the movement of the slide or ram is actuated by a compressed air from the regular shop supply, and can be regulated to the desired amount. The full pressure can be determined accurately and quickly. Once determined a release device prevents any danger of breakage due to excessive pressure. After the dies have been spotted, further pressure may be introduced, should this be considered necessary to obtain a sample shell.

The bed and ram are held in alignment by four guide rods and the frame is so designed that deflection cannot occur. The ram can be operated at any desired speed either fast or slow, as desired, and within easy control of the operator.

It is claimed that considerable savings can be made in die cost and that production presses are not tied up because of faulty dies. It is particularly suitable where there is a quantity of work to be done.

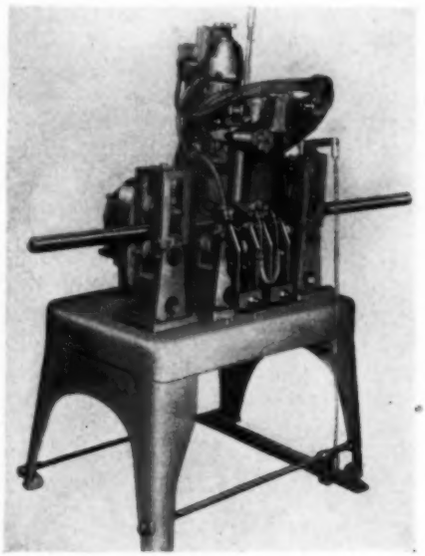



Marquette Die Spotting Machine, which is available in bench sizes to 100-ton models

## Lincoln Automatic Welder for Cross Brake Shafts

An automatic machine designed for the manufacture of brake cross shafts by use of the arc welding process has been placed on the market by the Lincoln Electric Company, Coit Road & Kirby Ave., Cleveland, Ohio. The purpose of this machine is to weld a longitudinal seam on the shafts as they come from the press on which they are formed. The shafts are fabricated of ⅛-in. plate and are formed into a tube 1¼ in. in diameter by 36 in. long. The edges of the strips of which the shaft is formed are crimped to form a longitudinal raised seam. These edges are fused together as they progress automatically under the arc at the rate of 36 in. per minute.

Shafts are fed through the machine under the stationary electrode automatically as the seams are welded. The "Electronic Tornado" principle is employed. Once the proper running speed has been determined, it is only necessary to place the shaft in position and start the arc. No filler rod, such as is generally used in automatic welding, is necessary on this particular job.



Lincoln Automatic Welder for cross brake shafts. A longitudinal raise seam is arc welded at the rate of 36 in. per minute

## "E. C. & M." Type NT Master Switch

Intended for use on cranes, hoists, and other applications where speed control from a master switch is desired, the Type NT master switch has been placed on the market by The Electric Controller & Manufacturing Company, 2700 E. 79th St., Cleveland, Ohio. Refinements to insure smooth and easy operation include: the use of ball bearings, the short throw of the operating handle, the absence of gears, and the fact that the contact fingers always ride on uninterrupted

"E. C. & M." Type NT Master Switch

plane surfaces. Also contributing to the smooth and even operation is an accurately machined, notched track, on which an improved roller-type centering device rides. This permits the operator to feel the various speed points and, of course, the notch in the "off" position is machined more deeply than the others.

The width of this master switch has been kept as small as possible, in order that several of these master switches can be mounted in a crane cage or operator's pulpit. Thus the operator can, without moving his position, conveniently reach and operate them. The switch can be mounted in the upright or inverted position. As shown, it is entirely inclosed by a heavy gage steel cover and is arranged for conduit connections. Both the contacts and contact fingers are of improved design and are easily renewable.

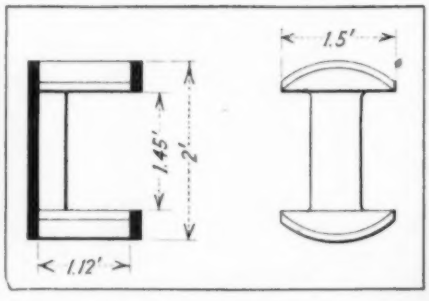
The type NT Master Switch is built to give a maximum of six points of speed control in each direction with overload reset at the "off" position. Master switches for 4, 5 or 6 points of speed control are identical, the only difference being the location of the arm stops. Since these stops are merely screwed into the main frame, they can be changed readily in the field to provide any one of these points of speed control.

## EQUIPMENT ADAPTATIONS

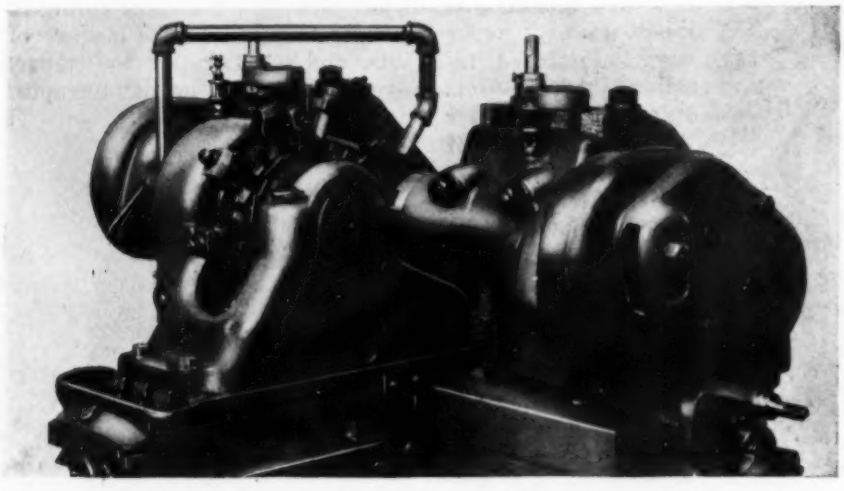
***Recently Developed by the Makers***

### Ferris Wheel Fixture on the Cincinnati Duplex Miller

Continuous milling of such small parts as malleable iron armature end pieces is done in the ferris wheel fixture mounted on the standard 18-in. "Duplex" Cincinnati automatic miller illustrated. This machine and fixture were supplied by the Cincinnati Milling Machine Company, Cincinnati, Ohio. The fixture itself is driven from a left-hand spindle carrier and both sides of the work are milled. One edge of the U-shaped work rests upon two flat surfaces and the other upon one fixed and one equalizing support. Each piece is located sideways against the clamp stud and is clamped over the top. Other sizes can be milled by simply changing the locating blocks and clamps to suit.




**Malleable iron armature end piece milled in machine below**

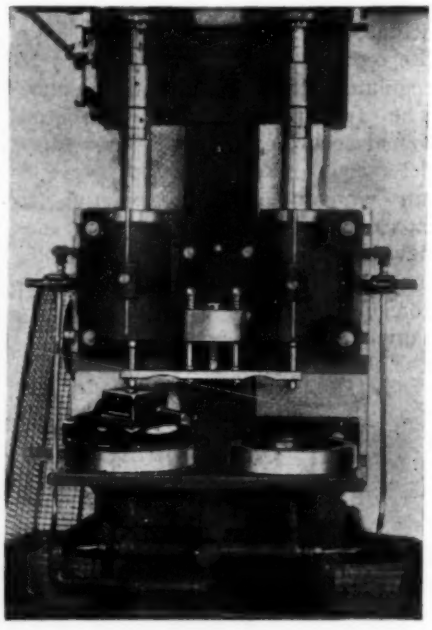


**Cincinnati Standard 18-Inch Duplex Automatic Miller equipped with a special universal ferris wheel fixture for milling both sides of a malleable iron armature end piece**

The fixture rotates continuously at 56 r.p.m., and all the operator has to do is to load and unload the parts in the portion of the fixture farthermost from the cutters. The table is stationary, being brought up to a special stop which strikes the bed of the machine. One-eighth inch of stock is removed by the two 2½-in. shell end mills. The time per piece is 0.2 min. and the production is 260 pieces per hour.

### Diamond Boring a Motor End Shield Bearing

Diamond tool boring can be applied to the boring of motor end shield bearings to increase the mechanical efficiency of the motor,



**Production Data**

| | |
|---|---|
| Part | end shield for electric motor |
| Material | bronze bushing |
| Operation | finish bore hole in bushing |
| Bore diameter | .625 in. |
| Bore length | 1.250 in. |
| Spindle speed | 4,000 r.p.m. |
| Feed | .0012 in. per rev. |
| Depth of cut | .005 in. |
| Limits | ±.00025 ft. |
| Machine cycle, 28 seconds, 2 pieces per cycle | |
| Machine cycle, 28 sec., 2 pieces per cycle | |
| Chucking time | 15 sec. for 2 pieces |

minimize wear, maintain an accurate air gap, and provide maximum bearing surface. Silent, smooth running is also obtained. The necessity for a

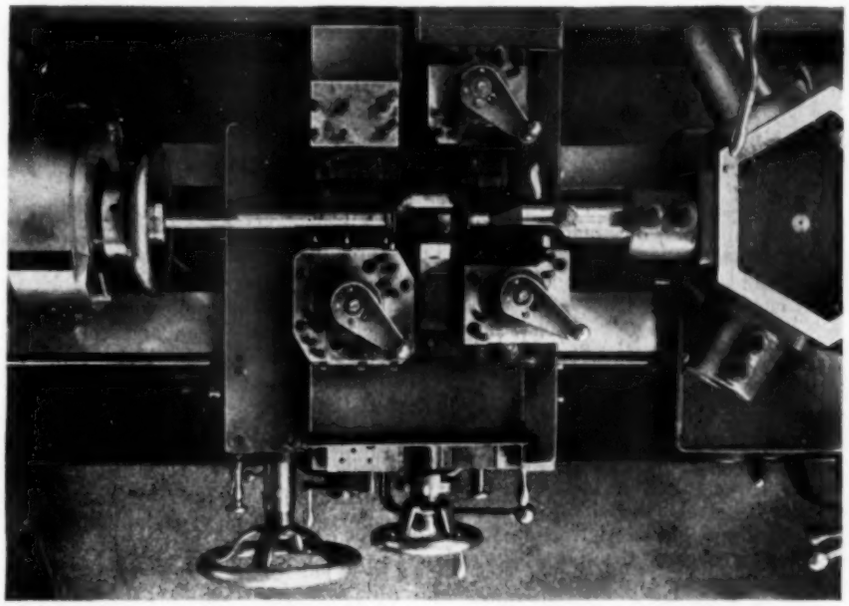
trial assembly is eliminated and fewer rejections are necessary because of noise or other causes.

An example of such work is shown on the Coulter two-spindle machine, a close-up being given. This machine is manufactured by the Automatic Machine Company, Bridgeport, Conn. On such work, it is claimed that of 240 pieces bored, only one piece was rejected for noise. A table of data pertaining to the production of this part is appended, and a close-up of the set-up is included.

## Crankshaft Tooling on a Gisholt No. 2L Turret Lathe

A forged steel crankshaft for a grain harvester is turned on a Gisholt No. 2L high-production turret lathe by the use of the special tooling shown. This equipment was built by The Gisholt Machine Company, Madison, Wis. A special feature is the large number of cutting tools employed, together with a special carriage, and a special indexing collet chuck. Doubling up on the tools for the longer turning operations cuts the production time appreciably. Finishing the crank-throw at the same chucking cuts it still more, making the floor-to-floor production time 12 min. per piece rather than one hour or more as required formerly.

A special cross-slide carries two quick-indexing square turrets at the front, with tools for rough and finish turning five diameters on the shaft. At the rear is a solid block with tools for facing four shoulders on the long end of the shaft, and also a quick-indexing square turret with tools for rough and finish turning the crank bearing. On the hexagon turret are tools for centering and chamfering the end of the forging, a self-opening die for threading the short end, a lubricated fixed center used when the main bearings are turned, and an offset center for supporting the shaft while the crank bearing is machined. The special hand-operated indexing collet chuck is accurately counterbalanced to minimize vibration and bearing strain while the work is set off-center and running at high speed.



Special tooling for production of a grain harvester crankshaft on a Gisholt No. 2L Turret Lathe. Note the large number of tools employed and also the special carriage and the special indexing collet chuck

## Grinding Diesel Engine Crankshaft Bearings

A plant on the Pacific Coast is using a Cincinnati 24x168-in. plain, self-contained grinder for grinding the main bearings of crankshafts for three-, four-, and six-cylinder Diesel engines. The grinder was furnished by Cincinnati Grinders Incorporated, Cincinnati, Ohio. The accompanying illustration shows the grinding of a shaft for a six-cylinder engine. Previous to finishing the crankshaft bearings on a grinder, they were machined on a lathe and filed. However, the demand for greater accuracy and better alignment of the bearings, together with faster machining, influenced the change.

The crankshafts are steel forgings and stock removal by grinding is 0.060 in. The limits are held to plus or minus 0.001 in. Floor-to-floor grinding time on the six-cylinder shaft is 3½ hours.

Features of the grinder include: electric rapid traverse to wheelhead; a ball-bearing grinding wheel spindle with chain drive; a main-drive, 30-hp., a.c. motor coupled by a flexible coupling; automatic pressure-feed lubrication to the tableways, and coolant control centralized with the other operating controls.

In a Pacific Coast plant, this large Cincinnati 24x168-Inch Plain, Selft-Contained Grinder is employed for grinding the main bearings of 3, 4, and 6 cylinder Diesel engine crankshafts

# TRADE · PUBLICATIONS

**An unusually diversified group of trade publications whose announcement was somewhat delayed by the special A.S.M.E. number**

CONTROLLERS. The Square D Co., Detroit, Mich., has published catalog No. 35-1-C on the products of its Industrial Controlier Division, Milwaukee, Wis. The catalog contains descriptions and specifications of a.c. automatic motor starters, combination starters, automatic starters, automatic compensators, hand-operated speed regulators, magnetic contactors, d.c. magnetic contactors, pressure, vacuum, and float switches, and push button and miscellaneous control stations.

DIE BLOCKS AND STEEL. The Heppenstall Co., Pittsburgh, Pa., has published a booklet entitled "Serving Industry for Three Generations," which gives a history of the company, cites the industries served, and lists the products. Among the last are acid open-hearth steel, die blocks, shear knives, forgings, electric induction steel, and alloy steel for the oil industry. Many photographs are included.

ELECTRO-CLEANING PROCESS. The Bullard Co., Bridgeport, Conn., has published a bulletin on the "The Bullard-Dunn Electro-Chemical Cleaning Process" for the removal of scale, oxides, and other foreign matter from the surface of metals without pitting, etching, or hydrogen embrittlement. The equipment used is illustrated.

FURNACES, HEAT-TREATING. The Ajax Electrothermic Corporation, Division of the Ajax Metal Co., Trenton, N. J., has published Bulletin No. 6 on "Ajax-Northrup" electric furnaces of the larger sizes energized with generators. The principal furnace types, standard furnace and generator performances, and photographs of typical installations are among the material included.

FURNACES, NITRIDING. The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa., has issued bulletin No. 950 entitled "The Homo Method Applied to Nitriding of Steel," which describes and illustrates the "Homo" nitriding furnace and shows many types of products which have been handled.

GRINDERS AND MILLING MACHINES. The Cincinnati Milling Machine Co., and Cincinnati Grinders Incorporated, Cincinnati, Ohio, have co-operated in publishing a 52-page catalog covering the standard line of machine tools manufactured by both companies. Illustrations, descriptions, and specifications of the medium-column type, automatic, and "Hydromatic" millers and cutter grinders are included by the first company, and similar typography and make-up shows the centerless and center-type grinders built by the second. This booklet also contains French and German descriptions.

GRINDING MACHINE APPLICATIONS. Cincinnati Grinders, Incorporated, Cincinnati, Ohio, has published a booklet entitled "Meet 1930 With These New Precision Grinding applications", which shows both center type and centerless installations. The booklet consists mainly of photographs, which clearly depict the operation of machines in question, and sufficient data is given to round out the material.

HONING EQUIPMENT. The Hall Manufacturing Co., Toledo, Ohio, has published a catalog entitled "Hall Honing Equipment," which gives construction details of the company's production and semi-production hones, and then describes the various models available.

LATHES, PRECISION. The South Bend Lathe Works, 426 East Madison St., South Bend, Ind., has published General Catalog No. 91-A, which is a two-color book giving complete descriptions and illustrations of the 96 sizes and types of "New Model" precision lathes. Prices are listed as well. Complete export information is also given in English, Spanish, Portuguese, French and German. The catalog contains 108 pages.

PRESSES, OPEN-BACK, INCLINABLE. The Niagara Machine & Tool Works, Buffalo, N. Y., has published Bulletin No. 58-D on its inclinable open-back presses, series 1. Descriptions, photographs, and specifications are given.

METAL SPECIALTIES. L. F. Grammes & Sons, Inc., Allentown, Pa., has published a catalog entitled "Grammes Metal Products," which illustrates the complete staple line of metal print craft and metal specialties. This shows such products as lithographed advertising plates, escutcheons and dials, badges and tags, small nails, hinges, support slides and countless other metal products.

ROLLER BEARINGS. The Hyatt Roller Bearing Co., Motor Bearings Division, Detroit, Mich., has published a general engineering bulletin on the application of Hyatt roller bearings to motor cars, trucks and buses. It gives the characteristics of these roller bearings, tables of load capacities, tables of limits, mounting suggestions, computations, and a large number of diagrams of installations.

SPROCKETS FOR ROLLER CHAIN. The Diamond Chain & Manufacturing Co., Indianapolis, Ind., has published a booklet giving the list prices of its sprockets for roller chain, as of March 1, 1930.

STELLITE PRODUCTS. The Haynes Stellite Co., Carbide and Carbon Bldg., 30 East 42nd St., New York, N. Y., has published a 32-page booklet entitled "Haynes Stellite Products in the Oil Fields," which describes Haystellite, Haynes Stellite, and Hascrome.

SWITCHES. The Square D Co., Detroit, Mich., has published catalog No. 35-S on safety switches of various types, plugs and sockets, end plates, meter service switches, and fittings.

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BOND STRENGTH OF CLAYS IN MOLDING SAND. The University of Illinois, Engineering Experiment Station, has published bulletin No. 200 entitled "Investigation of Endurance of Bond Strength of Various Clays in Molding Sand." The results obtained are applicable to the types of clays now being used for bonding or rebonding molding sands. The price of the bulletin is 15 cents from the above at Urbana.

SAFETY BOOKLETS. The National Safety Council, Civic Opera Bldg., 20 North Wacker Drive, Chicago, Ill., has published two safe practices pamphlets on "Safety Meetings" and "Industrial Shop Lighting." The first has been reviewed by the Safe Practices Committee, while the second pamphlet was revised by a Committee on Lighting of the Newark Safety Council, with valuable information and assistance from the Society for Electrical Developments, the Committee on Light and Safety of the Illuminating Engineering Society.

SAFETY REQUIREMENTS. The National Safety Council, Civic Opera Bldg., 20 North Wacker Drive, Chicago, Ill., has published a revision of its Safe Practices Pamphlet on "State Safety Requirements in Industry." The publication gives a subject chart and a publication list for the requirements of each state.

SCREW THREADS. The U. S. Department of Commerce, Bureau of Standards, has issued Miscellaneous Publication No. 109, which is a "Chart for Determining the Helix Angles of Screw Threads," showing helix angles for diameters from 0.05 to 10 in. and threads per inch from 1 to 100. This chart shows graphically the relationships among diameters, leads, and helix angles of screw threads or other helical surfaces. It may be obtained from the U. S. Printing Office, Washington, D. C., for five cents.

UNIONS, MALLEABLE IRON AND STEEL. The U. S. Department of Commerce, Bureau of Standards, has published Commercial Standard CS7-29, entitled "Standard Weight Malleable Iron or Steel Screwed Unions." The book is available from the Superintendent of Documents, Washington, D. C., for five cents.

# NEWS
## OF THE WEEK

**THE A.S.M.E. FIFTIETH ANNIVERSARY TABLET**
**This tablet was dedicated at the Engineering Societies Building on Saturday morning, April 5, to initiate the Fiftieth Anniversary observances of the Society**

## *A. S. M. E. Celebrates Fiftieth Anniversary By Planning for the Future*

THE American Society of Mechanical Engineers has passed its fiftieth birthday. Some 2,000 members of the society and guests were registered for the five-day observances held over the week-end in New York, Hoboken, and Washington, which commemorated the activities of the society during the past fifty years and indicated the direction in which the efforts of the next fifty years will be directed. On this page is shown the tablet which was dedicated at the Engineering Societies Building to begin the ceremonies.

The visitors were next taken by bus to the offices of the McGraw-Hill Publishing Company, publisher of *American Machinist*, where they were welcomed by Malcolm Muir, president; William Elmer, vice-president of the A.S.M.E., responded for the society. K. H. Condit, editor and publishing director of *American Machinist*, acted as master of ceremonies. Following a short playlet, the action of which took place in the first offices of the *American Machinist* just two days before the preliminary meeting of the founders of the A.S.M.E., the guests were taken on an inspection trip through the building.

Following luncheon as the guests of the company, the group went by bus to Stevens Institute at Hoboken, N. J., where the first society meeting was held. They saw there a pageant depicting the birth and growth of the society, together with a forecast of the future.

Commemorative services were held on Sunday morning at the Cathedral of St. John the Divine, in New York City, and the delegates then entrained for Washington, where the following three days were given over to sessions, inspection trips, and social observances. The complete story of the New York and Hoboken observances will appear in next week's *American Machinist*, the story of the Washington meetings the following week.

* * *

## French and Swiss Tools Also Bought By Soviet

The Soviet "Metalloimport," through its representation in France, has during the past year placed largely increased orders for machinery and tools in France and contiguous Belgium, Luxembourg, and Switzerland. The organization seeks out sources of supply rather than waiting for their needs to be anticipated by those who have commodities to sell. This virtually establishes a buyers' market. Soviet production needs are defined, and the follow-up from manufacturers is a natural result. It is said that what is chiefly sought is heavy metallurgical machinery, machine tools, measuring appliances, and metals susceptible of being transformed locally into machinery elements.

The sum total of the three years' operations in these specific lines is nearly five million dollars. All these items are essentially production goods and do not represent agricultural machinery, pumping machinery, motors, and the like for agricultural development.

Just how these purchases are paid for is not quite clear, but it is evident that the Commercial Representation of the Soviet Republics, with headquarters at Paris, through its Technical Import Committee, has been astute enough to trade off as much as possible with whatever Russian commodities may be available. It is known that large quantities of Russian wheat are finding their way to the French market, the throw back so far as the United States is concerned, being double acting to the extent that Russian supplies acquired by France curtail wheat from the United States and other sources by the same amounts.

* * *

## Quad-City Founders Entertain 450 Foundrymen

The Quad-City Foundrymen's Association was host recently to 450 Mid-West foundrymen in the Elks' club, Moline, Ill., at the first regional conference. More than half the members registered were from outside the Quad-City area and their attendance bespoke success and interest in the gathering. After a day of roundtable conference a banquet was held in the club with S. T. Johnson, Chicago, director of the American Foundrymen's Association, toastmaster. S. W. Utley, Detroit, president of the Michigan Manufacturers' Association, was principal speaker and talks were given by C. E. Hoyt, Chicago, representing the American Foundrymen's Association; W. R. Bean, Harvey, Ill., past president of that association and Arthur E. Hageboeck, Moline, manager of the Franks Foundries Corporation and past president of the Quad-City group. John H. Diedrich, of the Quad-City organization, arranged a tour of the plants in the area.

## *Washington Reviews Machinery Export Situation—Tariffs and Exports—Aircraft Not for Uncle Sam—Identifying Scrapped Metals—General Williams Retires*

By Paul Wooton
*Washington Correspondent, American Machinist*

WASHINGTON, D. C., April 9—While machinery and vehicles as a whole, along with a variety of commodities, were exported in less volume in February, numerous sub-divisions of the machinery list failed to follow the general trend of declining exports. The figures of the Bureau of Foreign and Domestic Commerce, which just have become available, show that in February, 1930, machinery and vehicles to the value of $91,342,983 were exported. This is $20,000,000 less than the value of exports in February, 1929, and is $9,000,000 less than the monthly average during 1929.

Despite this general trend, exports of electrical machinery and apparatus in February show an increase over February of last year. The respective figures are $10,072,224 and $8,877,738. The volume of exports in February of machinery in that class was fully up to the 1929 rate of export. The February movement, however, was some $100,000 less than that of January.

Much the same is true of industrial machinery. February exports were valued at $20,739,801. This is slightly in excess of exports in the preceding February, although the total is slightly below the monthly average of 1929, as well as that of January, 1930. Power-generating machinery showed quite a slump in February, but mining machinery and power driven metal-working machinery show increases over February of last year. Construction machinery moved in slightly less volume, as did sewing machines, sewing machine parts, and miscellaneous industrial machinery. A more decided decrease was shown in the value of textile machinery. Sales of farm machinery reached a new high level of $21,292,477. Some of the detailed figures are shown as follows:

| Class of Machinery | February 1929 | February 1930 |
|---|---|---|
| Engine lathes | $116,078 | $209,961 |
| Turret lathes | 100,911 | 111,658 |
| Other lathes | 118,353 | 100,151 |
| Vertical boring mills and chucking machines | 74,540 | 58,661 |
| Thread cutting and automatic screw machines | 82,929 | 105,254 |
| Knee and column type milling machines | 77,090 | 57,456 |
| Other milling machines | 121,162 | 76,514 |
| Gear cutting machines | 107,617 | 94,532 |
| Vertical drilling machines | 24,864 | 97,814 |
| Radial drilling machines | 21,969 | 20,950 |
| Other drilling machines | 38,696 | 229,197 |
| Surface grinding machines | 24,180 | 51,758 |
| External cylindrical grinding machines | 213,898 | 76,070 |
| Internal grinding machines | 131,989 | 200,507 |
| Tool grinding, cutter grinding and universal grinding machines | 41,755 | 70,350 |
| Other metal grinding machines | 92,074 | 62,676 |
| Sheet and plate metal-working machines | 269,103 | 251,029 |
| Forging machines | 98,685 | 159,617 |
| Rolling mill machinery | 139,416 | 29,202 |
| Foundry and molding equipment | 150,542 | 364,684 |
| Other power driven metal-working machinery and parts | 420,282 | 471,399 |

The increase in the demand for drilling machinery comes largely from the British Isles, France, and Russia.

Compared with the British figures for February covering metal-working machinery, the United States seems to be weathering the depression very well. British machinery imports in February showed a decided decrease.

Quantity production and economy of manufacture are the principal contributions made by metallurgical research in Army ordnance under the guidance of Major General C. C. Williams, Chief of Ordnance, who retired on April 1.

This research program has produced the cold-working method of gun construction, which supersedes the former built-up and wire wrapped methods. Stronger guns are made from one-piece forgings at a considerable saving in cost and time.

Centrifugal casting of guns also is a product of the research program directed by General Williams. Another laboratory job which holds great promise is the application of recent commercial developments in electric welding to gun carriage construction.

Examination of metals by means of the X-ray to determine the existence of internal flaws or defects was pioneered by the Ordnance Department. Process control in the foundry and in the welding shop has been greatly aided by the use of the X-ray. Standardization of impact methods for testing steels has led to obtaining better steels for guns. Minimum impact properties now are specified for gun steels in a similar manner to tensile properties. High-power photomicrography is proving of great value in the Ordnance Department's metallurgical research. Photomicrographs have been taken for many years at from 100 to 1,000 magnification but the equipment now installed at the Watertown Arsenal produces magnifications as high as 5,000.

The important developments which have occurred in Army Ordnance since the War are attributable to the vigorous support that the research laboratories have received from General Williams.

With imports of industrial machinery showing a steady increase, apprehension is felt that rate reductions carried in the Senate tariff bill, if finally adopted, will tend to aggravate an already severe competitive situation. Imports during 1929 were 33 per cent larger than in the preceding year and, although there has been some falling off this year, close observers of the international machinery market expect that imports will increase in volume as the year progresses. Little confidence is placed in the belief that a reduction in machinery tariffs will tend to stimulate export sales of American machinery. It is admitted that this may have some effect on export trade in general, but there never has been any evidence of such reciprocity in the foreign trade in machinery.

Exports of aircraft material, as recorded by the Department of Commerce, exhibited a continued upward trend both during February, 1930, as compared to the previous February, and during the two-month period ending February, as contrasted with the same period of 1929. Aircraft engines alone showed a diminution in foreign deliveries.

Airplanes, seaplanes and other aircraft to a value of $195,750 were exported during February, 1930, as compared with $274,189 for January and $122,473 for February, 1929.

Exports of aircraft parts and accessories, excepting tires, more than doubled the valuation for January and February of 1929 during the first two month of 1930. A decline of approximately 45 per cent in exports of aircraft engines is shown in a comparison of the figures for the Jan.-Feb. periods of 1929 and 1930.

Identification of fabricated metals for the purpose of facilitating their classification when scrapped is proposed by C. E. Julihn, engineer in charge of the common metals division of the Bureau of Mines, as a practical means of eliminating waste in salvaging scrap. Impressed with the seriousness of the problem presented by the vast amount of metal, especially high grade steel, that is wasted, Mr. Julihn suggests the adoption of simple symbols accurately expressing the character of the metals used in automobiles, machinery, and other metal products. Stamping the metal parts with such symbols would serve, in Mr. Julihn's opinion, to promote recovery of valuable constituents such as nickel, chrome, cobalt, vanadium, and tungsten, and at the same time simplify open-hearth smelting of scrap where steels of special composition cause trouble.

That the salvage value of the material would justify the expense of stamping cannot be questioned but, obviously, the system proposed by Mr. Julihn would depend for its successful operation upon

the determination of a code of symbols by an authoritative body which is in a position to obtain the co-operation of the manufacturers of metal products throughout the country. Such an attempt by an individual manufacturer would be futile as the volume of salvaged material available would not be sufficient to attract the interest of individual junk men even if they knew the system.

* * * *

# *National Metal Congress To Be Held In Stevens Hotel, Chicago*

FLOOR plans of the twelfth annual National Metal Exposition which will be held at the Stevens Hotel in Chicago, Sept. 22-26, inclusive, have been mailed to prospective exhibitors, according to W. H. Eisenman, secretary of the A.S.S.T. and director of the exposition.

The facilities of the Stevens Hotel will provide a fitting setting for the 1930 exposition, which is expected to surpass every previous show in convenience and attractiveness. For the first time all activities of the National Metal Congress and Exposition will take place under one roof. Technical sessions, the annual meeting of the Society, and other features of the Congress will all be held in the Stevens Hotel.

The 1930 show will cover approximately 75,000 sq.ft. of floor space. On the first floor of the hotel, in the exhibition hall and foyer, will be set up the heavy displays. Second-floor exhibits will be located in the grand ball room and its foyer, and in the lounge, writing room, and main dining room of the hotel. No restrictions are imposed by the exposition management as to the showing of heavy machinery, whether or not in operation.

A unique feature of the exposition is its all-expense cost to exhibitors, a new departure in show management. The exhibitor's booth rental includes cost of cartage to and from the railroad terminals; erection and dismantling of exhibits; the installation of connections for gas, electricity, air, and water as well as the cost of the current, gas, etc., used; furniture, carpenter work, signs and other charges hitherto paid separately by the exhibitor. Rental costs per square foot vary with the requirements.

* * *

## Steel Founders Discuss Customer Service

At a meeting in the Statler Hotel, St. Louis, on March 27, at which Burtner Fleeger, Oklahoma Steel Castings Co., Tulsa, Okla., presided, the Steel Founders' Society discussed ways and means for serving the industries of America. It was brought out that the production of steel castings involves more than the supplying of a commodity—it is distinctly an engineering service. Stressing this phase, F. J. Stanley, Michigan Steel Casting Co., Detroit, and others, advocated even greater co-operation with designers and engineers of the companies to whom the steel foundries sell.

According to the society, the first quarter of 1930 draws to a close with bookings, production, and shipments holding firm. A slight upward trend is apparent in some districts. Most foundries are optimistic regarding business during the second quarter.

The next meeting of the society will be held at Hotel Hollenden, Cleveland, on May 13 and 14, in conjunction with the Convention of the American Foundrymen's Association.

* * *

## Education to Be Keynote Of Foundrymen's Exhibit

Education, both of its own industry and of those affiliated with it, is the purpose of convention week of the American Foundrymen's Association, to be held in Cleveland, May 12 to 16. In connection with the convention there is also to be an exhibit of foundry equipment in the Cleveland Public Auditorium and Annex. One of the outstanding exhibits, covering 8,000 sq.ft. of floor space, will be a completely mechanized foundry unit in actual operation, with an electric furnace supplying the metal to a 1,000-lb. ladle. In conjunction with the exhibits will be shop operation courses stressing modern practice.

Several engineering societies, including the A.S.M.E. and the A.S.T.M., will have booths at the show to indicate their relation to the foundry industry, and over fourteen technical schools and colleges will be represented.

Papers to be presented at the convention include the following: Factors Affecting Machinability of Malleable Iron, Duplex Process of Producing Malleable Cast Iron, Effects of Prolonged Heating on Cast-Iron, Foundry Practices Affecting Enameling of Cast-Iron, Blistering Phenomena in the Enameling of Cast-Iron, Stronger Aluminum Castings by Improved Foundry Practice, Progress in Die Castings Industry, and Wear Testing.

* * *

## Aircraft Engineers To Discuss Problems

Two important conferences of aircraft engineers will be held in May to discuss economic and production problems confronting the air transport industry, according to a recent announcement by the A.S.M.E. The first conference, to discuss progressive designs for cheaper maintenance and operation, will be held in connection with the New York Airplane Show which opens at Madison Square Garden on May 3. The second conference, for outlining plans for cheaper production methods, will form part of the Fourth Annual Technical Aeronautical Meeting to be held at Wright Field, Dayton, Ohio, on May 20.

Recent reductions in prices by aircraft manufacturers and transport companies have created the impression in some quarters that the industry was trying to sell its wares at cost or less in the hope of winning public patronage according to the announcement. This is vigorously denied by members. At the New York conference problems of standardizing ground service, centralizing facilities and other keys to lower maintenance cost will be dealt with.

**WORLD'S LARGEST AND WORLD'S SMALLEST FATIGUE TESTERS**
**Charles Winninger, Star of "Show Boat," examining the world's smallest fatigue testing machine in the Westinghouse Laboratory. He is standing beside the world's largest. The smallest tests a specimen 0.05 in. in diameter; the largest 2.25 inches.**

# BUSINESS · BAROMETER

## *Outlook does not warrant present speculative buoyancy, although production is picking up steadily*

By THEODORE H. PRICE
*Editor, Commerce and Finance, New York*

IN TESTIFYING before a Congressional committee, William Green, president of the American Federation of Labor, created something of a sensation last week. He asserted that the idle industrial workers in the United States now number about 3,700,000, and that the unemployment had risen to 22 per cent in February. He said that as a result labor lost more than a billion dollars that it would have earned in wages if there had been work for it to do, and he expressed himself rather gloomily with regard to the outlook for trade in general, and the installment business in particular.

That Mr. Green's views may be regarded by those who are opposed to trade unions as *ex parte* and biased, is quite natural, but he has shown himself to be a man of great ability, independence, and candor. Therefore, it would be unwise to ignore his interpretation of what he asserts to be the fact.

But his views were entirely disregarded on the Stock Exchange, where prices have continued to mount and speculation has broadened from day to day. A substantial recovery from the low level reached last November was, of course, to be expected, but prices have now risen until they are in some cases higher than they were at any time last year, and it now seems advisable to watch one's step in following the advice to buy that is being handed out so generously and so widely by those who will be benefited by a further advance in prices.

The views that Mr. Green expresses with regard to overproduction, to underconsumption, to a slackening in trade, and to the situation that confronts those who have much money due them on the installment plan, are shared by many important merchants and manufacturers, and the buoyancy of the stock market has not yet extended itself to include the strictly commercial activities of the country.

It is difficult to give an adequate reason for the general expectation of a secondary Hoover boom that now seems to be anticipated. Every business man should be willing to subscribe to a creed which would include a declaration of his faith in America's prosperity. But there are times to laugh and times to refrain from laughter, and the wise optimist is the man who will apply the rule of reason to his interpretation of current events.

Just now the outlook does not seem to warrant the speculative buoyancy that is noticeable in so many directions. There is, however, one feature of the situation that may explain the rather anomalous aspect of the markets. This is the possibility of inflation as a result of the extraordinary expenditures that the national, state, and municipal governments have been authorized to make in order to provide work for the unemployed, and so avert the consequences of the decline in stocks which culminated last November. Including the revolving fund of $500,000,000 that was voted to the Federal Farm Board, and the various sums appropriated for new buildings, roads, etc., by Congress, a total of at least a billion dollars will be in circulation. As much more will probably be spent by the states and cities, so that a total of about two billion dollars will shortly be added to the credits placed at the disposal of the nation's enterprise by agencies of government.

This is an important factor, and if the revolving funds revolve fast enough the result may be an advance in most of the staples consumed in this country. The effect is already apparent in the cotton and grain markets, where the Federal Farm Board has been spending part of the money with which it has been supplied to purchase the surplus of last year's production.

If this operation should be successful, and the demand for the commodities accumulated proves to be sufficient to permit of their resale without loss, the transaction will undoubtedly be repeated many times over, and no one can put a limit upon its scope or its effect.

The steel business shows a slight improvement. Much interest is felt in the fight against the consolidation of the Bethlehem and Youngstown companies that is being staged in the Middle West. As this is written both sides seem confident of victory. Automobile and tire production is picking up slightly. Confident predictions of an expansion in the building industry later in the spring are to be heard, and preliminary figures indicate that March made a better showing than January and February in the total of contracts awarded.

The price of copper holds up astonishingly well. The outsiders are increasing their production, and it remains to be seen whether the great producers will hold the umbrella over their smaller competitors.

So far as the immediate future is concerned, it does not make much difference, and the present disposition of American business, as manifest in the stock market, is to avoid a long-distance view of the future, and content itself with trying to grab the profits which can be garnered from day to day.

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***From this page the reader will get a quick picture of current business and industry. The boxed material below is a summady of the letters from regional correspondents of the American Machinist, published in full on the opposite page.***

**SPOTTINESS is the predominating characteristic of the machinery and machine-tool market at this time. While some districts report better conditions, others report poorer; still others report no change. The general uncertainty of the business situation is reflected, as always, in the sales of tools, while the increasing optimism of prospective purchasers is reflected in the continuing increase in inquiries of the sort which are definite indications of business in the offing. Increasing confidence of buyers is also reflected in a better used-tool market.**

**NEW YORK dealers announce a distinct improvement, shown in increased single-item sales and a few good sized sales and inquiries. Philadelphia is uncertain now, but expects a rapid return to normal. Cincinnati business is dull and featureless, with a few two- and three-tool orders. Individual concerns booked orders for as many as three machines in the New England district, and conditions are brightening perceptibly. Chicago conditions are unchanged, although the situation is easing.**

**MILWAUKEE expects April to be the best month since November, the automobile industry leading in the pickup. Buffalo dealers are more optimistic, although business is still decidedly spotty there. Detroit seems wrapped in gloom, largely because of the continued cautious policy of the automobile industry, demonstrated in the seeming aversion to acquiring new tools, particularly from Detroit dealers.**

# THE INDUSTRIAL REVIEW

## Weekly progress of the machinery and machine-tool business

THE following reports, gathered from the various machinery and machine-tool centers of the country, indicate the trend of business in these industries and what may be expected from the future:

### NEW YORK

Most of the New York machinery and machine-tool dealers announce a distinct improvement in the market during the week, although thus far it is evidenced only in the increase in inquiries and single-item orders. There are, however, large orders being given, and the number is increasing from week to week. The New York Central is inquiring for several lathes, principally railroad types, and certain other tools. General Electric is also in the market, although not to an extent equal to that of last year, April, so far, is entirely satisfactory.

One large dealer reports one-third better sales in March than in February, with an increase in shipments considerably greater than that. New York dealers having New England offices report good business from that district, which they accredit largely to the constructive work of the New England Council and similar organizations during the past several years. The used tool market is showing some improvement, although most sales are for replacement purposes.

### PHILADELPHIA

The Philadelphia machinery and machine-tool market continued during the last two weeks in a somewhat uncertain condition. Leaders of the industry were not disheartened over the situation, expressing the belief that a recovery of normal business is not far ahead.

That belief was based upon the number and volume of inquiries received during the last fortnight. Inquiries were diversified as to area and nature of equipment, and came from substantial firms. The fact that the requests for prices and dates of delivery were for industrial equipment gave a further basis for the belief that the general business situation is not basically unsound.

Much interest was shown in the quarterly report of the Baldwin Locomotive Works, which revealed that on April 1 the company had on its books unfilled orders amounting to $22,137,000, which compared to $16,689,000 on April 1 of last year. The company is gradually expanding its operations, and is increasing the percentage of its plant operation.

### CINCINNATI

Business was dull and featureless during the past week in most instances, with a slight falling off of orders, as compared with the previous six-day period. The composite views of manufacturers is: "Plenty of business is pending, but orders are still 'hanging fire' and there still is a general tendency among prospective buyers to postpone the making of commitments."

To a very large extent, the week's business was made up of orders for single tools and replacements, but here and there was an order for two or three tools. The business was well scattered over the country and well diversified as to sizes and types. The principal buyers were miscellaneous industrial users and general machinists.

Inquiries were plentiful, the greater portion of these coming from miscellaneous users and general machinists.

### NEW ENGLAND

The current week showed little change in the New England machine-tool industry, but the seven days were not without their bright spots. Individual concerns booked orders for ten, six, and three machines, respectively. These companies still have a considerable volume of back logs, and find the situation well up to expectations. Such bright spots, however, are still a from-time-to-time part of business, and a steadily higher level of new orders has not materialized.

Foreign buying has been more spirited recently, and orders were placed for grinding and milling machines, with Connecticut and Massachusetts builders being favored. Executives anticipate action soon from the electrical and railroad industries.

Prospective buyers continue to fortify optimistic indications. Small plants are doing better, and are taking their share of machinery, totaling a fair amount in the aggregate. Spring has brought indications of improvement from aeronautical sources.

### CHICAGO

Conditions in the machine-tool industry have not changed materially during the last two weeks. The market continues dull in most lines, though here and there sales are reported which indicate at least an approach to increased production activities. As an instance of this it may be mentioned that one of the biggest tool manufacturing plants of the Middle West within the last week effected the sale of two of its largest production machines, both the buyers being engaged in the automobile building industry. Installation was requested at the earliest date possible. Manufacturers of small tools for machinists' use report business as better than for several weeks, one concern estimating its sales for March as within 20 per cent of those for the same month last year. Railroads continue to send out inquiries for machine shop equipment, the Santa Fe, Great Northern, and Milwaukee roads having added to the lists now in the hands of the trade. Demand for planers and shapers has shown but little recession this year, according to reports from an Illinois plant specializing in the production of these types of equipment.

### MILWAUKEE

Some members of the machine-tool trade profess to discern an upswing in business during the first week of April which leads them to believe that the month is going to measure up most favorably with any similar period since November, while others find new orders coming in slowly and business still showing signs of the hesitancy which has characterized the market for the past four to five months. The advance of the spring season is enlivening general business, and majority opinion favors the belief that hopes for genuine improvement are well founded.

More interest in the acquisition of metal working equipment by the automobile industry has become noticeable. The trade is not counting too heavily on automobile business, but feels that the replacement demand alone, once it gets under way, will go far in building up equipment trade.

Many other industries, notably manufacturers of electro-generating units, farm and industrial tractors and operating equipment, and railroad shops, are stepping up production schedules and are more inclined toward acting upon requirements in anticipation of which inquiry has been going out steadily. Observers say that the almost total lack of bargaining for prices may be considered a good sign. Delivery dates appear to be more a matter of concern than prices, indicating that many prospective buyers wish to make sure that when purchases become necessary, there will be no long delays in getting equipment.

While shipments of tools are still in larger volume than new orders, most plants have sufficient business on their books to keep comfortably busy for an indefinite period. Meantime, prospects are for development of new business to maintain this situation in a steadily improving manner.

### BUFFALO

Machine-tool dealers in the Buffalo district are somewhat more optimistic concerning business than they have been at any time since the first of the year. Business still remains decidedly spotty, with most of the buying being done by small firms and most of the orders being for single machines.

Employment reports indicate that industrial conditions are improving. The demand for contractors' equipment has been relatively good this spring, both in the field of road construction and buildings. There are several state, municipal, and business projects of considerable magnitude going on throughout western New York. In the electrical equipment field, conditions are practically the same as in the machine-tool field.

There is no activity in the automobile industry, and it is expected that conditions in the aviation industry will be quiet despite the fact that the recent Aviation Show has quickened interest considerably. Buying in this field was heavy last spring and few changes are being made this season.

### DETROIT

The period of depression in the machinery and machine-tool trade in the Detroit area shows few signs of immediate improvement. Few sales have been made within the past few weeks, and the inquiries have been infrequent and insignificant.

During the second and third weeks of March there was a slight alleviation of the conditions which had existed for several weeks, but the promised turn for the better did not materialize.

Within the past ten days, one firm received an order for six lathes to be used by one of the large tool shops. This order is the largest received by the firm in many weeks and one of the largest reported here recently. The automobile plants are doing very little in the way of extending or even replacing their equipment. The orders they place are mainly for occasional replacements of worn-out machinery.

One favorable sign is the fact that a large number of air compressors are being sold, often a presage of industrial activity.

While many manufacturers predict that conditions will improve within the next month, they are not committing themselves to any programs of expansion. The contract jobbing shops are idle.

Business in general in Detroit and Michigan is no better than it has been for the past several months. Employment has improved very little.

# Business Items

Canadian Warren-Pink, Ltd., St. Catharines, Ont., has decided to erect a plant in Vancouver, B. C., and has purchased a site at Fourth Ave. and Cambie St. The firm is a subsidiary of the amalgamated firms of Warren & Co., and Pink & Co., of Warren, Ohio. J. H. Bennet is Canadian manager.

The Simplex Wire & Cable Co., Boston, Mass., has opened a branch office in the Fidelity-Philadelphia Trust Bldg., Philadelphia. Elden L. Howe is office manager.

The Ohio Electric & Controller Co., 5900 Maurice Ave., Cleveland, changed its name to the Ohio Electric Manufacturing Co. at the annual meeting of the shareholders on March 14.

Stedfast & Roulston Co., Boston, has been appointed agents of the Baker Brothers, Inc., Toledo, Ohio, in the Massachusetts territory.

The H. B. Dockray Brass & Iron Co., Zanesville, Ohio, has changed its name to the Wise Foundry, Machine & Supply Co. Louis H. Wise is president and general manager.

The Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, has changed its Cleveland office to 1941 Union Trust Building.

Officers and directors of the Decatur (Ill.) Pump Co. were re-elected at the annual meeting recently. They are: W. A. Shorb, president; A. W. Burks, vice-president and general manager; W. L. Waddell, secretary-treasurer. The board of directors includes these officers and James D. Johnson, B. F. Templeton, and W. C. Field.

The Indian Motocycle Co., Springfield, Mass., has acquired exclusive rights to manufacture in America all the developments of the Sunbeam Motor Car Co. of Great Britain. Included is a new type Diesel engine suitable for automobile or airplane.

The Fairmont (W. Va.) Manufacturing Co. has changed its name to the Fairmont Aluminum Co., Fairmont, West Virginia.

The National Broach Co., Dayton, Ohio, has changed its name to the National Broach & Machine Co., and is now located at Shoemaker & St. Jean, Detroit, Michigan.

The R. E. Dietz Co. plant at 225 Wilkinson St., Syracuse, N. Y., is to be amplified by the manufacturing business of the New York plant of the company, according to a recent announcement by Robert A. Currie, manager. Gradual transfer of the machinery in New York is being undertaken. The main offices and officers of the company will remain in New York City.

The Wm. G. Harvey Co., 540 First Trust & Deposit Bldg., Syracuse, N. Y., and 307 Crosby Bldg., Buffalo, has been appointed sales representative in the Syracuse and Buffalo territories for the complete line of the Modern Tool Works Division, Consolidated Machine Tool Corporation of America.

The Chicago Pneumatic Tool Co., 6 East 44th St., New York City, has opened new branch offices in the Perrine Bldg., Oklahoma City, Okla.; at 327 Philcade Bldg., Tulsa, Okla.; and in the Merchants & Manufacturers Bldg., Houston, Texas.

The Electric Machinery Manufacturing Co., Minneapolis, Minn., has moved its Baltimore office to 600 North Calvert St., Baltimore.

The Lincoln Electric Co., Cleveland, Ohio, has opened new offices at Saginaw, Mich., Fort Wayne, Ind., and Oil City, Pa. The Saginaw office is located at 338 Barnard St. and is in charge of J. E. Luter. The Fort Wayne office is in charge of D. H. Carver and is located at 225 E. Columbia St. E. D. Anderson is in charge of the new office in Oil City.

The Smith Booth Usher Co., Los Angeles, has been appointed distributor of the Union Twist Drill Co., Athol, Mass. The S. W. Card Manufacturing Co. has appointed the same company as its distributor for its line.

The Bullard Co., Bridgeport, Conn., held its annual meeting on March 19 and increased its board of directors from seven to eleven members. The new directors are: H. C. Bullard, E. C. Bullard, J. W. Bray, sales manager; and T. E. Dunn, works manager. Officers were re-elected.

The Driver-Harris Co., Harrison, N. J., has moved its Chicago offices to 1138-40 West Washington Blvd., on the ground floor.

Henry Prentiss & Co., Inc., New York, has moved its Buffalo office to 1452 Hertel Avenue.

The General Electric Co. is exhibiting lighting equipment, instruments, and auxiliary devices at the All-American Aircraft Show, in Detroit.

# Personals

D. E. ANNIX, associated with the Greenfield Tap & Die Corporation, Greenfield, Mass., for about 19 years, more recently as production manager, has been transferred to the Detroit office engineering department.

A. L. ASSMUS, vice-president of the Cleveland Trust Co., has been appointed a director of the Apex Electrical Manufacturing Co., Cleveland, to succeed E. L. WORTHINGTON, resigned.

ING. FRANZ BERMANN, superintendent in the locomotive factory of the Austro - Hungarian State Railway, Vienna, and a frequent contributor to *American Machinist*, has resigned to open an office as a consulting engineer in mechanical work in Vienna.

R. M. BLAKELOCK of the General Electric Co., Schenectady, will lecture on "Applications of Micro-Motion Study to the Manufacture of Small Parts," at a meeting of the A.S.M.E. sponsored by the Management Division at the Fraternity Clubs Building in New York City on April 17.

C. M. BRIGHAM has been elected to the board of directors of the North American Car Corporation, succeeding HERMAN HACHMEISTER, resigned.

L. H. BYRNE was recently appointed acting western sales manager for the Jefferson Electric Co., Chicago.

HOMER S. TRECARTIN, general manager of the Roller Bearing Co. of America, Trenton, N. J., resigned his position on April 1 to join the Russian organization Sharikopodskipnekstroy,

represented in this country by the Amtorg Trading Corporation, New York. The Russian organization is arranging to build and equip one of the largest factories in the world for the manufacture of ball and roller bearings. Mr. Trecartin's work will be in relation to the direction of the design and equipment of the new plant.

CLARENCE M. DAY has resigned as general manager of the Jackson Steel Products Co., a division of the General Motors Corporation, Jackson, Mich., effective May 1.

WILLIAM H. DAVEY, president of the Empire Steel Corporation, Mansfield, Ohio, is improving steadily in Baltimore where he recently underwent a major operation.

JOHN E. GALVIN, president of the Ohio Steel Foundry Co., Lima, has been elected president of the Lima Manufacturers' Association to succeed Benjamin F. Thomas.

C. GIFFAULT, previously manager of the New York sales district for the Baltimore Copper Mills Division, Revere Copper & Brass, Inc., Rome, N. Y., was recently made Philadelphia office manager. DAVID INGMAN, formerly Cincinnati representative, has been appointed assistant to Mr. Giffault.

GEORGE E. GUSTAFSON has been appointed manager of the Chicago branch of the Kearney & Trecker Corporation, Milwaukee. He will be assisted by FRANK RIFFLE, formerly a member of the Chicago sales force; WILLIAM FOTSCH, an engineer from the production service department, and EDGAR TRECKER.

G. V. MYRMIRIAN, French agent for the Errington Mechanical Laboratory, New York, sailed on March 28 for France, after a visit in this country.

W. S. PRATT, formerly production engineer for the Heald Machine Tool Co., for ten years, and assistant to the president and general manager of the Toledo Machine Tool Co. for four years, is now works manager of the National Acme Co.'s Windsor plant.

J. JUDSON PROVOST, formerly with General Motors and the E. W. Bliss Co. and of late years a commercial consultant, has become manager of the Richmond Engineering Co., Philadelphia, formerly the Richmond Sheet Metal Engineering Company.

WILLIAM J. SAVAGE, vice-president, sales and advertising manager of the Heltzel Steel Form & Iron Co., Warren, Ohio, resigned, effective March 15, to accept a similar position with the Brown Clutch Co., Sandusky, Ohio.

JAMES W. SCHOFIELD, formerly in the Los Angeles office of the Columbia Steel Corporation, is now affiliated with the American Rolling Mills Co. of California, San Francisco.

ROGER SHULMAN and JAMES F. FERRY, of the Board of Directors of the Continental Motors Corporation, Detroit, were recently elected vice-presidents. B. F. TOBIN, JR., was made treasurer.

FURMAN G. SPENCER, production manager of the Upson Walton Co., Cleveland, spent two weeks beginning March 10 at the office of the Assistant Secretary of War for training in Ordinance Procurement activities.

C. J. STILWELL, vice-president of the Warner & Swasey Co., Cleveland, sailed recently on the *Albert Ballin* for a 3-month tour of Europe.

ROLLAND D. E. ULLMAN has moved his office to 246 South 15th St., Philadelphia, Pa.

B. VAN DYKE, of the Quincy (Ill.) sales division of the Gardner-Denver Co., has been transferred to the New York office of the organization. HENDRICK STOLK, until recently with Stokvis & Zonen, of Holland, has just been transferred to the St. Louis office.

JOSEPH G. WORKER of the American Engineering Co., Philadelphia and D. S. BRISBIN, of the Chisholm-Moore Hoist Corporation, have been elected chairman and vice-chairman of the Electric Hoist Manufacturers' Association.

# Obituaries

AUGUSTUS H. BULLARD, 63, secretary-treasurer of the Bullard Company, died in Bridgeport, Conn., on April 5. He had been ill for a month.

WILLIAM J. BURNS, 76, retired former superintendent of the Singer-Nimick Works, Pittsburgh, of the Crucible Steel Co. of America, died March 22 at his home in Bellevue, Pennsylvania.

JAMES D. COWAN, secretary and treasurer of the National Lock Washer Co., Newark, N. J., died on Feb. 26.

JOHN D. CUTTER, manager of the shackle division of the Fafnir Bearing Co., New Britain, Conn., died in that city on March 11.

JOHN D. EBY, president of the Eby Machinery Co., San Francisco, Calif., 82, died at his home in Oakland, Calif., March 23. Mr. Eby came to California in 1884 and established himself in the machine business in San Francisco.

WILLIAM P. HAYES, 50, identified in an executive capacity with the Black & Germer Stove Works, Erie, Pa., died at a hospital in that city on March 29, following a short illness.

ELWIN R. HYDE, president of the Bridgeport Safety Emery Wheel Co., Inc., Stratford, Conn., for the past 40 years, died on March 25 at his home 158 Savoy St., Bridgeport, following a week's illness. Mr. Hyde was born in West Chester, Mass., 79 years ago and had been connected with the grinding industry for more than half a century.

WILLIAM O. JACKSON, iron works head, died on March 25 at his home in Hollywood, Calif., after a three-week illness. He had been president of the Jackson Iron Works since its founding in 1908.

OLIVER B. MAIN, 76, president of the Howe Steel Products Co., Chicago, died recently at a hospital in Pasadena, California.

EUGENE MAXWELL MOORE, 39, vice-president and director of Manning, Maxwell & Moore, Inc., New York, died on March 27 in New York City, after a brief illness. He was a brother of Charles A. Moore, president, a son of Charles A. Moore, one of the founders, and had been actively connected with the organization since 1913.

H. B. MYERS, Philadelphia and Washington manager of the Lehigh Structural Steel Co., Allentown, Pa., died recently at his home in Washington.

JAMES WARNER SCAIFE, 61, president and director of William B. Scaife & Sons Co., Oakmont, Pa., died on March 31.

WILLIAM L. SCHUMACHER, 58, vice-president and treasurer, Toledo (Ohio) Wheelbarrow Co., died unexpectedly March 21 from a stroke suffered while playing golf.

GEORGE W. SHAW, 59, general manager of C. S. Davis & Co., Inc., 46th St. and 1st Ave., Brooklyn, died at his home in that city on March 23.

WALTER S. WILLIAMS, 76, Providence, R. I., died at St. Petersburg, Fla. on March 17. He was president of the New England Ventilating & Heating Co., Providence.

JAMES FRANCIS SULLIVAN, vice-president and director of the Midvale Steel Co., Philadelphia, for many years before it was merged into the Midvale Steel & Ordnance Co., died of pneumonia on March 17 at Radnor, Pennsylvania.

# Forthcoming Meetings

AMERICAN WELDING SOCIETY—Annual meeting at Society headquarters, New York City, April 22-25. M. M. Kelly, 33 West 39th St., New York, is secretary.

NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION—General Cost Conference at Hotel Cleveland, Cleveland, Ohio, April 22-23. E. F. DuBrul, 1415 Enquirer Bldg., Cincinnati, is general manager.

NATIONAL POWER SHOW — Held in connection with the International Textile Exposition, Mechanics Bldg., Boston, Mass., April 28 to May 3. For information write to New England Association of Commercial Engineers, 53 Devonshire Road, Boston.

AMERICAN FOUNDRYMEN'S ASSOCIATION — Annual Convention, Cleveland Public Auditorium, Cleveland, Ohio, May 12-17. C. E. Hoyt, 222 W. Adams St., Chicago, is secretary-treasurer.

NATIONAL FOREIGN TRADE COUNCIL —Convention at Hotel Biltmore, Los Angeles, May 21-23. O. K. Davis, 1 Hanover Square, New York City, is secretary.

SOCIETY OF AUTOMOTIVE ENGINEERS —1930 Summer Meeting, French Lick Springs Hotel, French Lick Springs, Ind., May 25-29. National headquarters are at the Engineering Societies Bldg., 29 W. 39th St., New York City.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS — Semi-annual meeting, Hotel Book-Cadillac, Detroit, June 2 to 12. Calvin W. Rice, 29 West 39th St., New York City, is secretary.

NATIONAL ASSOCIATION OF FOREMEN —Convention at Toledo, Ohio, June 6-7. Harry J. Baumker, 316 Tenth St., Toledo, is convention secretary.

STEEL INDUSTRY'S EXECUTIVES—Annual Iron & Steel Exposition. Under the sponsorship of the Iron & Steel Electrical Engineers, June 16-20, Broadway Auditorium, Buffalo, N. Y. John F. Kelly, 1010 Empire Bldg., Pittsburgh, Pa., is managing director.

AMERICAN SOCIETY FOR TESTING MATERIALS—Annual meeting, Haddon Hall, Atlantic City, N. J. June 23-27. C. L. Warwick, 1315 Spruce Street, Philadelphia, is secretary-treasurer.

STEEL FOUNDERS' SOCIETY OF AMERICA—Semi-annual convention, Greenbrier Hotel, White Sulphur Springs, Va., June 26-27. G. P. Rogers, 932 Graybar Bldg., New York City, is managing director.

INTERNATIONAL CONGRESS FOR GENERAL MECHANICS — Liege, Belgium, Aug. 31 to Sept. 7. For information address Alb. Schlag, 4 Place Saint Lumbert, Liege, Belgium.

# THE WEEKLY PRICE GUIDE . . .

### *Rise and Fall of the Market*

DISCOUNTS were increased about two points on the new Pittsburgh basing card of Apr. 1, 1930, for jobbers' carloads. This marks the first change in the mill price since April 19, 1923. Introduction of new methods of manufacture perhaps more than lack of demand, accounts for the reduction in price. Shapes and reinforcing bars are seasonally in active demand. Metal prices, generally, are very close to the depression levels of 1922.

*(All prices as of Apr. 4, 1930)*

## IRON AND STEEL

**PIG IRON**—Per gross ton, f.o.b:

| | |
|---|---|
| CINCINNATI | |
| No. 2 Southern (silicon 1.75@2.25) | $17.69@$18.19 |
| Northern Basic | 19.90 |
| Southern Ohio No. 2 | 19.90 |
| NEW YORK—Tidewater Delivery | |
| No. 2 Southern (silicon 1.75@2.25) | 19.50 |
| BIRMINGHAM | |
| No. 2 Foundry (silicon 1.75@2.25) | 15.00 |
| PHILADELPHIA | |
| Eastern Pa., No. 2x (silicon 2.25@2.75) | 21.76@22.26 |
| Virginia No. 2 | 24.04 |
| Basic | 19.75@20.25 |
| CHICAGO | |
| No. 2 Foundry, local (silicon 1.75@2.25) | 20.00 |
| No. 2 Foundry, Southern (silicon 1.75@2.25) | 20.01 |
| PITTSBURGH, including freight charge ($1.76) from Valley: | |
| No. 2 Foundry | 20.26 |
| Basic | 20.26 |
| Bessemer | 20.76 |

**IRON MACHINERY CASTINGS**—Cost in cents per lb. of 100 flywheels, 6-in. face x 24-in. dia., hub not cored, good quality gray iron, weight 275 lb:

| | |
|---|---|
| Detroit | 4.50 |
| Cleveland | 5.00 |
| Cincinnati | 4.4.75 |
| New York | 5.50 |
| Chicago | 4.50@7 |

**SHEETS**—Quotations are in cents per pound in various cities from warehouse; also the mill base in large lots:

| Blue Annealed* | Pittsburgh Mill Base | Chicago | Cleveland | New York |
|---|---|---|---|---|
| No. 10 | 2.10 | 3.35† | 3.30 | 3.60† |
| No. 12 | 2.15 | 3.45† | 3.35 | 3.65† |
| No. 14 | 2.25 | 3.55† | 3.45 | 3.70† |
| No. 16 | 2.35 | 3.65† | 3.55 | 3.80† |
| Black | | | | |
| Nos. 18 to 20 | 2.35@2.55 | 3.85† | 3.55 | 3.70 |
| No. 22 | 2.50@2.70 | 4.00† | 3.70 | 3.85 |
| No. 24 | 2.55@2.75 | 4.05† | 3.75 | 3.90 |
| No. 26 | 2.65@2.85 | 4.15† | 3.85 | 4.00 |
| No. 28 | 2.80@3.00 | 4.75† | 4.00 | 4.15 |
| Galvanized | | | | |
| No. 10 | 2.60@2.70 | 3.90† | 3.80 | 3.80 |
| Nos. 12 to 14 | 2.70@2.80 | 4.00† | 3.90 | 3.90 |
| No. 16 | 2.80@2.90 | 4.10† | 4.00 | 4.00 |
| No. 18 | 2.95@3.05 | 4.25† | 4.15 | 4.15 |
| No. 20 | 3.10@3.20 | 4.40† | 4.30 | 4.30 |
| No. 22 | 3.15@3.25 | 4.45† | 4.35 | 4.35* |
| No. 24 | 3.30@3.40 | 4.60† | 4.50 | 4.50 |
| No. 26 | 3.55@3.65 | 4.85† | 4.75 | 4.75 |
| No. 28 | 3.80@3.90 | 5.10† | 5.00 | 5.00 |

*Light plates. †Up to 3,999 lb.

**WELDED STEEL PIPE**—Warehouse discounts are as follows

| | New York | | Cleveland | | Chicago | |
|---|---|---|---|---|---|---|
| | Black | Galv. | Black | Galv. | Black | Galv. |
| 1 to 3 in. butt | 53.74% | 41.2% | 55.5% | 43.5% | 55.5% | 42.5% |
| 3½ to 6 in. lap | 50.32% | 37.78% | 53.5% | 40.5% | 51.6% | 39.0% |

WROUGHT-STEEL PIPE LIST

| Size, Inches | List Price per Foot | Diameter in Inches External | Diameter in Inches Internal | Thickness Inches |
|---|---|---|---|---|
| 1 | $0.17 | 1.315 | 1.049 | .133 |
| 1¼ | .23 | 1.66 | 1.38 | .14 |
| 1½ | .27½ | 1.9 | 1.61 | .145 |
| 2 | .37 | 2.375 | 2.067 | .154 |
| 2½ | .58½ | 2.875 | 2.469 | .203 |
| 3 | .76½ | 3.5 | 3.068 | .216 |
| 3½ | .92 | 4.0 | 3.548 | .226 |
| 4 | 1.09 | 4.5 | 4.026 | .237 |
| 5 | 1.48 | 5.563 | 5.047 | .258 |
| 6 | 1.92 | 6.625 | 6.065 | .28 |
| 8 | 2.50 | 8.625 | 8.071 | .277 |

**SEAMLESS STEEL TUBING**—Following net prices are for seamless mechanical tubing, cold drawn, round, .10 to .30 carbon, at New York warehouse in lots of less than 100 ft. or 100 lb:

| Thickness B.w.g. and Decimal Fractions | | Outside Diameter in Inches ¼ | ⅜ | ½ | ⅝ | ¾ | 1 | 1¼ | 1½ |
|---|---|---|---|---|---|---|---|---|---|
| | | Price per Foot | | | | | | | |
| .035" | 20 | $0.15 | $0.16 | $0.17 | $0.18 | $0.19 | $0.21 | $0.23 | |
| .049" | 18 | .17 | .18 | .19 | .20 | .21 | .23 | .25 | |
| .065" | 16 | .19 | .20 | .21 | .22 | .23 | .25 | .27 | |
| .083" | 14 | .20 | .22 | .23 | .24 | .25 | .27 | .29 | |
| .095" | 13 | .21 | .23 | .25 | .26 | .27 | .29 | .31 | |
| .109" | 12 | .22 | .24 | .26 | .27 | .28 | .30 | .32 | |
| .120" or .125" | 11 | .23 | .25 | .27 | .28 | .29 | .31 | .33 | |
| .134" | 10 | .24 | .26 | .28 | .29 | .30 | .32 | .34 | |

**MISCELLANEOUS**—Warehouse base prices in cents per lb:

| | New York | Cleveland | Chicago: |
|---|---|---|---|
| Spring steel, light* | 4.50 | 4.65 | 4.65 |
| Spring steel, heavier | 4.00 | 4.00 | 4.00 |
| Coppered Bessemer rods | 6.05 | 6.00 | 6.20 |
| Hoop steel | 4.25† | 4.00 | 3.75† |
| Cold rolled strip steel | 6.25 | 6.00 | 6.10 |
| Floor plates | 5.10† | 5.30 | 5.00† |
| Cold drawn, round or hexagon‡ | 3.40 | 3.65 | 3.60 |
| Cold drawn, flat or square‡ | 3.90 | 4.15 | 4.10 |
| Structural shapes | 3.30† | 3.00 | 3.10† |
| Soft steel bars | 3.25† | 3.00 | 3.00† |
| Soft steel bar shapes | 3.25† | 3.00 | 3.00† |
| Soft steel bands | 3.75† | 3.65 | 3.20† |
| Tank plates | 3.30† | 3.00 | 3.10† |
| Bar iron (2.75 at mill) | 3.2 | 3.00 | 3.00 |
| Drill rod (from list) | 60% | 55% | 50% |

*Flat, ⅜-in. thick by ¼-in. wide, released for shipment at one time. †Up to 3,999 lb., ordered and ‡Cold finished steel, shafting and screw stock.

Electric welding wire at New York warehouse— 3/32, 8.35c. per lb.; ⅛, 7.85c. per lb.; 5/32 to ¼, 7.35c. per lb.

## METALS

Warehouse Prices in Cents Per Pound for Small Lots:

| | | | |
|---|---|---|---|
| Copper, electrolytic, New York | | | 19.25 |
| Tin, Straits, pigs, New York | | | 39.50@40.50 |
| Lead, pigs, E. St. Louis | 5.60 | New York | 6.50@ 7.00 |
| Zinc, slabs, E. St. Louis | 4.85 | New York | 6.50@ 7.50 |

| | New York | Cleveland | Chicago |
|---|---|---|---|
| Antimony, slabs | 10.50@11.00 | 11.50 | 14.50 |
| Copper sheets, base | 27.75 | 27.75 | 27.75 |
| Copper wire, base | 20.12½ | 20.12½ | 20.12½ |
| Copper, drawn, round, base | 26.25 | 26.25 | 26.25 |
| Copper tubing, base | 29.25 | 29.25 | 29.25 |
| Brass sheets, high, base | 23.25 | 23.25 | 23.25 |
| Brass tubing, high, base | 28.25 | 28.25 | 28.25 |
| Brass rods, high, base | 21.25 | 21.25 | 21.25 |
| Brass wire, high, base | 23.75 | 23.75 | 23.75 |

# SHOP MATERIALS AND SUPPLIES

## METALS—Continued

| | New York | Cleveland | Chicago |
|---|---|---|---|
| Aluminum ingots, 99%..... | 25@26 | 24.30 | 24.30 |
| Zinc sheets (casks)..... | 10.25@11.00 | 11.75 | 10.11 |
| Solder (½ and ½)..... | 28.50 | 27.50 | 26@28 |
| Babbitt metal, delivered in case lots, New York, cents per lb: | | | |
| Genuine, highest grade..... | | | 56.00 |
| Commercial genuine, intermediate grade..... | | | 42.00 |
| Anti-friction metal, general service..... | | | 31.00 |
| No. 4 babbitt, f.o.b..... | | | 11.25 |

**NICKEL AND MONEL METAL**—Price in cents per lb., base, f.o.b. Huntington, W. Va:

| | Nickel | Monel Metal |
|---|---|---|
| Sheets, full finished..... | 52.00 | 42.00 |
| Sheets, cold rolled..... | 60.00 | 50.00 |
| Strip, cold rolled..... | 55.00 | 45.00 |
| Rods, hot rolled..... | 45.00 | 35.00 |
| Rods, cold drawn..... | 53.00 | 40.00 |
| Tubing ..... | 75.00* | 90.00† |
| Angles, hot rolled..... | 50.00 | 40.00 |
| Plates..... | 52.00 | 42.00 |

*Seamless. †Welded.

**OLD METALS**—Dealers' purchasing prices in cents per pound, f.o.b. cars:

| | New York | Cleveland | Chicago |
|---|---|---|---|
| Crucible copper..... | 14.75@15.25 | 13.50 | 14.00 @14.50 |
| Copper, heavy, and wire.. | 13.50@14.75 | 13.00 | 13.00 @13 50 |
| Copper, light, and bottoms | 12.00@13.00 | 12.00 | 12.00 @12.50 |
| Heavy lead..... | 4.00@ 4.75 | 5.25 | 3.50 @ 4.00 |
| Tea lead..... | 2.75@ 3.00 | 3.25 | 2.50 @ 3.00 |
| Brass, heavy, yellow..... | 7.75@ 8.00 | 8.00 | 7.25 @ 7.75 |
| Brass, heavy, red..... | 11.25@11.75 | 12.50 | 10.25 @10.75 |
| Brass, light..... | 6.25@ 7.00 | 7.00 | 6.25 @ 6.75 |
| No. 1 rod-brass turnings.. | 9.00@ 9.25 | 8.00 | 8.00 @ 8.50 |
| Zinc..... | 2.50@ 2.75 | 3.00 | 2.00 @ 2.50 |

**TIN PLATES**—Charcoal—Bright—Per box:

| | New York | Cleveland | Chicago |
|---|---|---|---|
| "AAA" Grade: | | | |
| IC, 14x20..... | $12.10 | $11.95 | $11.50 |
| "A" Grade: | | | |
| IC, 14x20..... | 9.70 | 9.90 | 9.50 |
| Coke Plates—Primes—Per box: | | | |
| 100-lb., 14x20..... | 6.45 | 6.10 | 7.00 |
| Terne Plates—8-lb. Coating—Small lots—Per box: | | | |
| IC, 14x20..... | 7.75@8.00 | 7.00 | 7.50 |

## MISCELLANEOUS

| | New York | Cleveland | Chicago |
|---|---|---|---|
| Cotton waste, white, per lb.. | $0.13* | $0.16 | $0.15 |
| Cotton waste, colored, per lb.. | .09½* | .12 | .12 |
| Wiping cloths, washed, white, per lb..... | .12½ | 38.00 per M | .16 |
| Sal soda, per lb..... | .02½ | .02 | .02 |
| Roll sulphur, per lb..... | .028 | .03½ | .04 |
| Linseed oil, raw, in 1 to 4 bbl. lots, per lb..... | .15 | .164 | 154 |
| Cutting oil, about 25% lard, in 5 gal. cans, per gal..... | .75 | .60 | .65 |
| Machine oil, medium-bodied (55 gal. steel bbl.) per gal.. | .33 | .36 | .24 |
| Belting — Present discounts from list in fair quantities (½ doz. rolls) for leather or rubber: | | | |
| Leather—List price, 24c. per lin. ft., per inch of width, for single ply: | | | |
| Medium grade..... | 30–10% | 30–10% | 35% |
| Med. grade, heavy wgt... | 30% | 30– 5% | 30% |
| Rubber transmission, 6-in., 6 ply, $1.83 per lin.ft: | | | |
| First grade..... | 50% | 50–10% | 50% |
| Second grade..... | 60% | 60– 5% | 50–10% |

*Grade F.

## *Comparative Warehouse Prices*

| New York | Unit | Current Price | Four Weeks Ago | One Year Ago |
|---|---|---|---|---|
| Soft steel bars..... | per lb.. | $0.0325 | $0.0325 | $0.0325 |
| Cold drawn shafting... | per lb.. | .034 | .034 | .035 |
| Brass rods..... | per lb.. | .2125 | .2125 | .2487½ |
| Solder (½ and ½)..... | per lb.. | .285 | .2925 | .3525 |
| Cotton waste, white... | per lb.. | .13 | .13 | .10@.13½ |
| Disks, aluminum oxide mineral, cloth, No. 1 6-in. dia..... | per 100. | 4.59 | 4.59 | 3.60 |
| Lard cutting oil..... | per gal.. | .75 | .75 | .55 |
| Machine oil..... | per gal.. | .33 | .33 | .33 |
| Belting, leather, medium..... | off list.. | 30–10% | 30–10% | 30–10% |
| Machine bolts, up to 1x30 in., full kegs.... | off list.. | 50–10%* | 50–10%* | 50–10%* |

*List prices as of April 1, 1927.

## MISCELLANEOUS—Continued

| | New York | Cleveland | Chicago |
|---|---|---|---|
| Abrasive materials — Standard grade, in sheets 9x11 in., No. 1, per ream of 480 sheets: | | | |
| Flint paper*..... | $6.03 | $6.03 | $6.03 |
| Emery cloth*..... | 25.87 | 25.87 | 25.87 |
| Disks, aluminum oxide mineral, 6 in. dia., No. 1, per 100: | | | |
| Paper†..... | 2.61 | 2.61 | 2.61 |
| Cloth†..... | 4.59 | 4.59 | 4.59 |
| Fire clay, per 100 lb. bag..... | 1.00 | .75 | .75 |
| Coke, prompt furnace, per net ton..... | | Connellsville, | 2.60 |
| Coke, prompt foundry, per net ton..... | | Connellsville, | 3.50@4.85 |
| White lead, dry..... | 100 lb. kegs ... | New York, | 13.75 |
| White lead, in oil..... | 100 lb. kegs.... | New York, | 14.25 |
| Red lead, dry..... | 100 lb. kegs.... | New York, | 13.75 |
| Red lead, in oil..... | 100 lb. kegs.... | New York, | 15.25 |

*Less than 3 reams. †Less than 200.

## SHOP SUPPLIES

Discounts from new list dated Apr. 1, 1927, applying on immediate deliveries from warehouse stocks in New York and vicinity:

| | |
|---|---|
| Machine bolts: | |
| Up to ¾-in. x 6-in., full kegs, list less..... | 60% |
| Larger, up to 1 x 30-in., full kegs, list less..... | 50–10% |
| Less than full kegs or case lots, add to list..... | 10% |
| Fitting-up bolts: list less..... | 45% |
| Lag screws: | |
| Up to ½-in. x 6-in., list less..... | 60% |
| Larger, list less..... | 50–10% |
| Less than full keg or case lots, add to list..... | 10% |
| Rivets: | |
| Structural, round head, full kegs, net..... | $4.50 |
| Structural, round head, broken kegs, net..... | 6.00 |
| Tank, $\frac{7}{16}$-in. dia. and smaller, list less..... | 60% |
| Nuts: | |
| Hot pressed, square or hexagonal, blank or tapped: | |
| Full kegs up to 1-in., incl., list less..... | 60% |
| Larger, up to 3-in., list less..... | 40–10% |
| Less than keg or case lots, add to list..... | 10% |
| Washers: | |
| Wrought, full kegs, per 100 lb., list less..... | $4.00 |
| Wrought, broken kegs, per 100 lb., list less..... | 2.00 |
| Turnbuckles: | |
| With stub ends, list less..... | 20% |
| Without stub ends, list less..... | 50% |
| Chain: | |
| Proof coil, base, per 100 lb., net..... | $8.50 |
| Cast iron welding flux, per lb., net..... | .35 |
| Bronzing flux, per lb., net..... | .50 |

# MACHINE REQUIREMENTS AND INDUSTRIAL CONSTRUCTION

## Equipment Wanted

**Calif., Fort Mason** — Quartermaster Supply Office, Washington, D. C.—will receive bids until Apr. 21 for one complete turntable crane including turntable, all parts, fittings and accessories and spares for air corps retriever, H. 1. here.

**D. C., Washington**—Dept. Public Bldgs. and Public Parks—will receive bids until Apr. 11 for woodworking machinery, metal machinery and lathes.

**Mass., Boston**—School Committee, 15 Beacon St., A. M. Sullivan, Mgr.—will receive bids until Apr. 15 for manual training supplies for various schools throughout city.

**Mass., Boston**—Woodcraft Supply Co., 15 Washington St.—woodworking equipment, including lathes.

**Mass., Somerville** (Boston P. O.) — School Committee—tools and equipment for five shops in proposed addition to junior high school.

**N. Y., New York**—W. C. Martin, Supt. of School Buildings, Bd. of Education, Flatbush Ave. Ext. and Concord St., Brooklyn—will receive bids until Apr. 15 for machinery and tool equipment, etc., for Evander Childs high school at Gun Hill Rd., Bronxwood Ave., Magenta St. and Barnes Ave., here, also for Abraham Lincoln high school, at Ocean Parkway, West Ave., Riverside Ave. and West 2nd St.

**O., Bellaire**—International Stamping & Enameling Co., B. G. Witten, Mgr.—stamping machine and grinder.

**O., Columbus**—Tilt-Top Mfg. Co., 801 Buckeye Bldg. J. R. Stewart, Pres., (patented window fasteners)—rolling machine, two punch presses and automatic machine for factory.

**O., Dayton**—Acme Pattern & Mfg. Co., 232 North Findlay St. R. Klandis, Pres., (manufacturers of metal and wood patterns)—machinery and equipment including metal working and woodworking equipment for new shop.

**Ore., Eugene**—Southern Pacific R.R., 68 Market St., San Francisco, Calif., F. W. Taylor, Purch. Agt.—turret lathe, 18 in. lathe, radial drill press., 600 ton wheel press, 600 ton locomotive crane, 38 in. draw-cut shaper, steam hammer, air compressor, etc. for proposed improvements to shops here.

**Pa., Easton**—Bd. of Education, R. E. Peifer, Secy.—will receive bids until Apr. 14 for machinery and equipment for manuel training, machine and print shops for school year.

## Opportunities for Future Business

**Calif., Martinez**—Alhambra Union High School Dist., R. L. Boyer, Clk, Bd. of Trustees, will receive bids until Apr. 24 for the construction of a junior high school including main building, shop building, etc. Estimated cost $240,000. W. H. Weeks, 111 Sutter St., San Francisco, Archt.

**Conn., Hartford**—W. I. Charter, 680 Broadview Terrace, is receiving bids for the construction of a 2 story, 60 x 100 ft. automobile service station on High St. Estimated cost $40,000. G. Matthews, 48 Campbell Ave., Archt.

**Conn., Meriden** — International Silver Co., J. A. Hutchinson, 48 State St., is having plans prepared for a 1 story, 40 x 300 ft. addition to factory E. Estimated cost $50,000. Private plans.

**Ga., Savannah** — United Shank & Findings Co., E. R. Laird, Pres., Whitman, Mass., plans the construction of a plant here. Estimated cost $100,000. H. C. Farrell, Ch. Engr.

**Ill., Chicago**—Continental Can Co., 4633 West Grand Ave., awarded contract for masonry, etc., for a 3 story, 84 x 140 ft. factory at 4647 West Grand Ave. Estimated cost $180,000.

**Ill., Chicago** — Triangle Package Machinery Co., 416 West Huron St., awarded masonry contract for a 1 story, 75 x 112 ft. factory at 906 North Spaulding Ave. Estimated cost $25,000.

**Ill., East St. Louis**—Key Boiler Equipment Co., 27th and McCausland Ave., awarded contract for a 1 story, 61 x 160 and 39 x 139 ft. addition to factory.

**Ill., Fort Sheridan** — Constructing Quartermaster, will receive bids until Apr. 16 for a 50 x 266 ft. repair shop and storage building.

**Ind., Terre Haute**—Hardware Supply Co., is having plans prepared for the construction of a plant. Estimated cost $43,000. Private plans.

**Ky., Louisville**—Henry Vogt Machine Co., 12th and Oak Sts., plans the construction of a 7 story addition to factory. Estimated cost $35,000.

**Ky., Louisville** — Yellow Cab Co., 9th and Liberty Sts., awarded contract for the construction of a 1 and 2 story, 105 x 205 ft. garage, workshop, etc. Estimated cost $50,000.

**La., Shreveport**—City is having plans prepared for the construction of a municipal airport including hangars, machine shop, etc. Jones, Roessle, Olschner & Weiner, Archts.

**Md., Baltimore**—J. H. Ferguson, 1918 Harford Ave., is having plans prepared for the construction of a 2 and 3 story, 112 x 200 ft. factory and garage at Elm Ave. and 32nd St. Estimated cost $200,000. F. Thomas, 726 East 33rd St., Archt. H. F. Doeleman, Baltimore Trust Bldg., Engr.

**Mass., Cambridge** (Boston P. O.)—W. Crane, L. Hayward St. (builder) will build a 1 story, 55 x 200 ft. factory at Rogers and Binney Sts. Estimated cost $45,000. Private plans. Work will be done by owners forces.

**Mass., Cambridge**—Firestone Tire & Rubber Co., 1286 Main St., Akron, O., is having plans prepared for a 1 story service station at 13 to 59 Broadway here, $45,000; soon awards contract for a 2 story garage, service station and warehouse on Spadina Ave., Toronto, Ont. $100,000; awarded contract for a 2 story, 160 x 209 ft. service station at Linwood Blvd. and Troots Ave., Kansas City, Mo., $165,000; awarded contract for a 1 story, 69 x 48 x 32 ft. service station at Bedford Ave. and Adams St., Johnstown, Pa.

**Mass., Cambridge**—General Radio Co., 30 State St., awarded contract for a 4 story, 50 x 100 and 20 x 25 ft. radio manufacturing plant. Estimated cost $125,000. Noted Mar. 13.

**Mass., Foxboro**—The Foxboro Co., Neponset Ave., is receiving bids for a 2 story addition to factory for the manufacture of gauges and thermometers. Estimated cost $40,000. Private plans. Noted Feb. 6.

**Mass., Malden** (Br. Boston)—Eastern Ave. Auto Parts Co., 182 Eastern Ave., will soon receive bids for a 1 story addition to service station and shop, etc. Estimated cost $40,000. G. A. Cornet, 7 Munroe St., Lynn, Archt.

**Mass., Mansfield**—A. Pedini, 399 North Main St., is receiving bids for the construction of a 1 story repair and service garage, etc., at Prate St. and Fuller Pl. Estimated cost $40,000. L. G. Foster, 101 North Main St., Archt.

**Mass., West Roxbury** (sta. Boston)—Park Dept., 33 Beacon St., awarded contract for the construction of a 1 story garage and shop at Franklin Park Yard. J. M. Gray and J. P. Hefferman, 175 High St., Boston, Archts.

**Neb., Omaha**—Father Flanagan's Boys Home, West Dodge St., is having preliminary plans prepared for a power and machine building. Estimated cost $50,000.

**N. H., Portsmouth**—S. Shapiro, 67 Islington St., awarded contract for the construction of a 1 story garage, repair shop and service station at Islington and Parker Sts. Estimated cost $40,000.

**N. J., Harrison**—Driver-Harris Co., Middlesex St., will receive bids about May 15 for the construction of a 1 and 2 story addition to factory. Estimated cost, $250,000. J. A. Finegan, 776 Broad St., Newark, Archt.

**N. J., Jersey City**—Burstyn Heftler Corp., 404 38th St., Union City, is receiving bids for the construction of an 8 story, 130 x 225 ft. garage at Bergen Ave. and Academy St. here. Estimated cost $450,000. C. Shilowitz, 26 Journal Sq., Jersey City, Archt.

**N. J., Newark**—J. B. Acocella, 9 Clinton St., Archt., will receive bids about Apr. 15 for a 2 story, 100 x 150 ft. garage, etc., for owner, c/o Archt. Estimated cost $150,000.

**N. J., Newark**—J. Black, 246 Central Ave., is receiving bids for a 1 story auto radiator shop at 268-274 Central Ave. Estimated cost $40,000. M. A. Wolf, 845 Broad St., Archt.

**N. J., Newark**—P. B. West, 24 Commerce St., Archt., will receive bids about May 1 for the construction of a 2 story factory, etc. at Maple Pl. for General Alloy Co., 188 New Jersey Railroad Ave. Estimated cost $40,000. Noted Mar. 27.

**N. Y., Brooklyn** — C. Bender, 94 Prospect Park, S. W., is receiving bids for the construction of a garage, shop, etc., at 194 Ashland Pl. Estimated cost $40,000. A. A. Blaustein, 1102 Kings Highway, Archt. Noted Feb. 27.

**N. Y., Brooklyn**—Herman Glaberson, 2401 Ave. I., plans the construction of a 4 story, 75 x 88 ft. garage at State and Court Sts. Estimated cost $100,000. Seelig & Finkelstein, 153 Pierrepont St., Archts.

**N. Y., Brooklyn**—M. Pope, 460 Sterling Pl., will receive bids about July 1 for the construction of a 1 story, 100 x 100 ft. garage at Brooklyn Ave. and Rutland Rd. Estimated cost $40,000. J. T. Riggs, 717 Atlantic Ave., Archt. Noted Mar. 20.

**N. Y., Brooklyn** — Shell Eastern Petroleum Products Co., 122 East 42nd St., New York, plans the construction of a garage, etc. here. Estimated cost $50,000. R. Shutkind, 147 4th Ave., New York, Archt.

**N. Y., New York**—M. Michaelson, 539 West 47th St., will soon award contract for altering building into garage at 406 West 45th St. Estimated cost $60,000. L. Rogel, 367 Fulton St., Brooklyn, Archt.

**N. Y., New York**—Standard Concrete Steel Co., 250 8th Ave., is receiving bids for the construction of a garage, warehouse, etc. at 217 West 19th St. Estimated cost $125,000. R. L. Senior, 606 First Ave., Archt. Noted Mar. 27.

**O., East Cleveland** (Br. Cleveland)—McKay Structural Steel Co., 14414 Elderwood Ave., had plans prepared for a 1 story, 30 x 100 ft. structural shop on Eastham St. Estimated cost $40,000. Private plans.

**O., New Philadelphia**—Greer Steel Co., H. C. Chappel, Pres., awarded contract for the construction of a factory. Estimated cost $30,000.

**Pa., Lansdale**—Bd. of Education, H. L. S. Ruth, 501 North Broad St., plans the construction of a 2 story, 66 x 172 and 66 x 87 ft. garage and service building. W. M. Hughes, 147 North 5th St., Reading, Archt.

**Pa., Meadville** — Hookless Fastener Co., L. Walker, Pres., East Arch St., will receive bids until Apr. 15 for a 3 story, 50 x 70 ft. factory. Wilbur Watson & Associates, 4614 Prospect Ave., Cleveland, O., Archts. Noted Mar. 13.

**Pa., Oil City**—Montana Bros., 1 Central Ave., is having plans prepared for the construction of a 1 story, 50 x 56 ft. service station at Front and Central Sts. Estimated cost $40,000. Crosby & Crosby, 31 Beers Bldg., Archts.

**Pa., Ridgway**—Viking Metal Products Co., E. T. Johnson, Pres., Jamestown, N. Y., will soon receive bids for a 1 story, 120 x 280 ft. factory here. Estimated cost $40,000. Private plans.

**Pa., Toss Township**—Wellington Motor Co., R. E. Phrush, 4705 Perryville Rd., West View, is receiving bids for the construction of a 2 story, 50 x 60 ft. garage on Perrysville Rd. here. Lake & Davidson, Negley Bldg., Pittsburgh, Archts.

**Tenn., Memphis**—Memphis Power & Light Co., 179 Madison Ave., has work under way for a 2 story 60 x 100 ft. addition to garage on Dunlop St. Estimated cost $35,000.

**Tex., San Antonio**—Presto-O-Lite Co., Inc., 30 East 42nd St., New York, N. Y., will soon award contract for the construction of a 1 story, 70 x 110 ft. factory and warehouse on Cassiano St. Private plans.

**Tex., Uvalde**—A. B. Mayhew, et al., acquired a site and plans the construction of an airport including hangars, machine and repair shops, etc. Estimated cost $100,000. Private plans.

**Wis., Milwaukee**—H. V. Miller, 862 3rd St., Archt. is receiving bids for the construction of a 2 story, 60 x 200 ft. garage, etc. at Forest Home for Windler Garage, 1034 Mushego Ave.

**Wis., Sheboygan**—Wisconsin Power & Light Co., 900 Gay Bldg., Madison, awarded contract for the construction of a 2 story, 66 x 275 ft. freight station and service building here.

**Ont., Glen Miller**—Miller Bros., plans the construction of a machine shop. Estimated cost $20,000.

**Ont., Toronto**—Trane Co., 2nd and Cameron Sts., Lacrosse, Wis., plans the construction of a factory for the manufacture of concealed heaters and unit heaters, here.

**Ont., Welland** — Page Hersey Tubes Ltd., plans the construction of a new plant. Estimated cost $2,000,000.

**Chile, Santiago de Chile**—Curtis-Wright Export Corp., 27 West 57th St., New York, N. Y., will build an aeroplane manufacturing plant, including hangar, office, etc., at Los Cerrillos airport, here. Estimated cost $500,000. Work will be done by separate contracts.